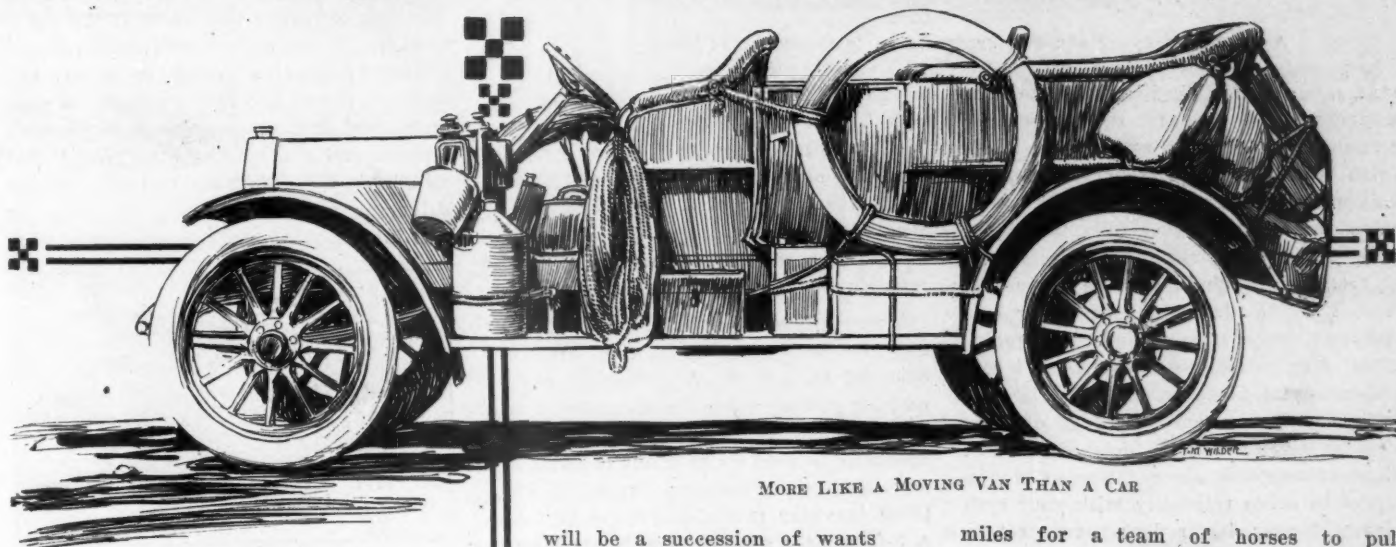


MOTOR AGE

Motoring's Ounce of Prevention



MORE LIKE A MOVING VAN THAN A CAR

THERE are perhaps 50,000 owners of 1910 cars who never have gone touring further than the confines of their native city and it is for them that this and the two following pages of this issue are intended. The car owner who has made the run from his home to Chicago or New York will find little new herein, but there are many points of special worth for those who are driving their car for the first time and in whose minds the desire for a tour through the country has been burning for some time. In the matter of touring it must be remembered that first of all a tour should be for pleasure, otherwise whatever trip the owner determines upon should be labeled a business trip. If pleasure is the prime essential in a tour then conditions that are conducive to pleasure should be looked after before the tour starts.

Preparation the Keynote

What is true in touring is true in a dozen other undertakings that every mortal has to deal with during his existence on this mundane sphere, and vice versa. Touring is nothing new, but a new adaptation of an old condition. Starting out on a tour from Chicago to Denver is much the same today as it was centuries ago to start out on a caravan trip across a tropical country. In those days preparation was the keynote, and so it is today. The tourist who wants to enjoy the tour must have every preparation made in advance otherwise the tour

will be a succession of wants and delays; wanting those articles of clothing which were not thought of before the start, wanting those tools for the car that did not even enter the mind of the driver before starting out, wanting those extra cans of oil that never were deemed necessary, wanting that supply of extra inner tubes and casing, wanting the length of rope with block and tackle that is so necessary if because of a slippery road the car skids into a ditch, wanting that small light for the speedometer for night travel, wanting that little electric light to read the guide book for night work, wanting that little coil of fine copper wire that is so necessary on every run, wanting that little bottle of carbon-remover or kerosene for the cylinders, and wanting a score of other things that are sure to be needed if the tour is to extend over a week or so.

Delays Great Inconvenience

But the wants are not the only inconveniences in a tour—the delays because of these wants are the real troubles. It is not pleasant to walk 2

miles for a team of horses to pull you out of a ditch and pay \$2 for the service when a length of rope would have taken care of the trouble. An extra clip or so in the supply box before the start of a run will save hours on the tour in case a spring leaf should break, whereas if the clips are not on hand it may be a case of the entire spring breaking before a satisfactory repair can be effected and then a delay of a day or more is imperative until a new spring is secured and put in place. This story of starting out like the foolish virgins with lamps but no oil in them is specially applicable with a car in touring. It is not essential that a car be loaded down with spare parts that might be needed on the tour; spare parts rarely are needed if the driver is watchful of his car; spare parts only are needed by those drivers who are so listless or so lazy that they fail to detect loose parts and do not know that anything is wrong until the part has broken or been lost.

Preparing For Touring

By way of preparation of the car for a tour a few general observations may be in order. Do not start out with a conscience-stricken feeling that you are going to break the entire car to pieces before the tour ends. The amount of trouble you will have depends on the caliber of the driver. Cars have started out on pleasure tours with over 700 pounds of spare parts varying all the way from driveshafts for the



AN ELECTRIC LIGHT FOR THE SPEEDOMETER IS ESSENTIAL IN TOURING

rear axle or complete differential to extra magnetos, spare gears for the gearset, new steering knuckle parts, extra brake bands, extra bearings for the front wheels, extra valves and springs and a complete host of extra parts. It is sheer folly to take so many additional parts along. The weight of them is enough to put the car out of commission if the regular passenger load and some baggage are carried. The trouble of carrying so many extra parts so inconveniences the passengers as to eliminate from the tour every symptom of that pleasure which is the life blood of the tour. These spare parts are not needed if you expect to drive rationally with your eyes open. If your driver does not expect to keep his eyes open, then you had better fasten to each running board one or two extra springs, a new front axle or perhaps a new rear axle because in nine cases out of ten you will need them. On the other hand if your driver possesses a rational amount of gray matter and has ordinary eyesight he will be able to see the bad road spots and can slow down so that there will not be any necessity of breaking springs or axles.

Parts That Are Needed

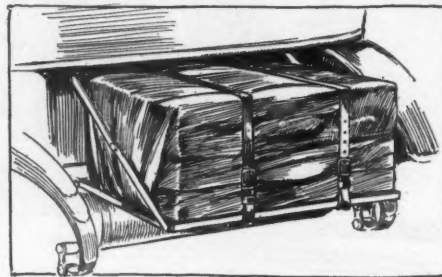
The question now arises as to what spare parts a tourist should take along: To begin with a good supply of mixed cotter-pins is very essential. If the nuts on your car are cotter-pinned, one of these may shear off for some reason or another and a substitute is very essential. It may be that a locking pin in a bearing will be lost and another pin can be made from a cotter-pin. There are a score of little happenings that may take place in the repair of which a cotter-pin is most necessary. Next to cotter-pins comes a supply of a couple of dozen different-sized bolts that can be used in case of breakage of standard bolts in the car. If a rivet in a frame bracket breaks a bolt can be inserted instead and no delay is suffered. Perhaps third in the order of importance in a repair kit are several coils of wire of different gauge. Wire is a most useful article. If a rod breaks a temporary repair can be made by splicing with a

couple of pieces of wood or short lengths of metal, the wiring completing the job. There have been many cars that have toured for weeks consecutively without more spare parts than cotter-pins, bolts and a few lengths of wire. To this, of course, must be added spark plugs and a roll of tape for repairing leaks or doing other jobs.

There are several accessories, if they may be designated such, that are very essential on a tour. A collapsible canvas pail for getting water for the radiator is a prime requisite. Nothing is more undesirable than to need water in the radiator and have to go to a farmhouse for a pail when there is water available by the roadside. A 3-foot piece of 2 by 4-inch scantling is often very necessary. This comes in handy if an axle has to be jacked up on ground so soft that the jack sinks into the earth under the car weight. Two or three leather straps ranging from 18 inches to 3 feet in length are very necessary in case tire iron brackets break and the spare casings have to be strapped on. These straps may be useful in a dozen other ways.

Having determined on the number of spare parts to carry, it is of equal necessity that the tool roll be looked into carefully to see that all of the necessary tools are in place and in good shape. Do not be like the driver who started on a 1,000-mile run and only discovered when 10 miles from

any town that he had not a pair of pliers in the tool kit. As a preliminary precaution look over the entire outlay of tools for the car and also for the tires. With some makes of cars the tool supply is not adequate for long trips and it is up to the driver to see that a supply is carried. This list should include two pairs of pliers, one small and one large monkeywrench, a set of special wrenches furnished with the car—there should be half a dozen in this group—a wrench for hub caps, a wrench for removing spark plugs, one for removing valve caps, two or three spanner wrenches, and perhaps one compound wrench that will serve for a dozen parts of the car. If needed a socket wrench for reaching out-of-the-way parts of the car is needed. Do not start out without a couple of screwdrivers, a cotter-pin puller, one hammer, one or two center punches, a common metal drift, magneto wrench, gas-tank wrench and the several other parts that will be included in your tool kit. If the driver is at all familiar with soldering the kit should include a small soldering



WRAP SUIT CASES THAT ARE CARRIED IN REAR

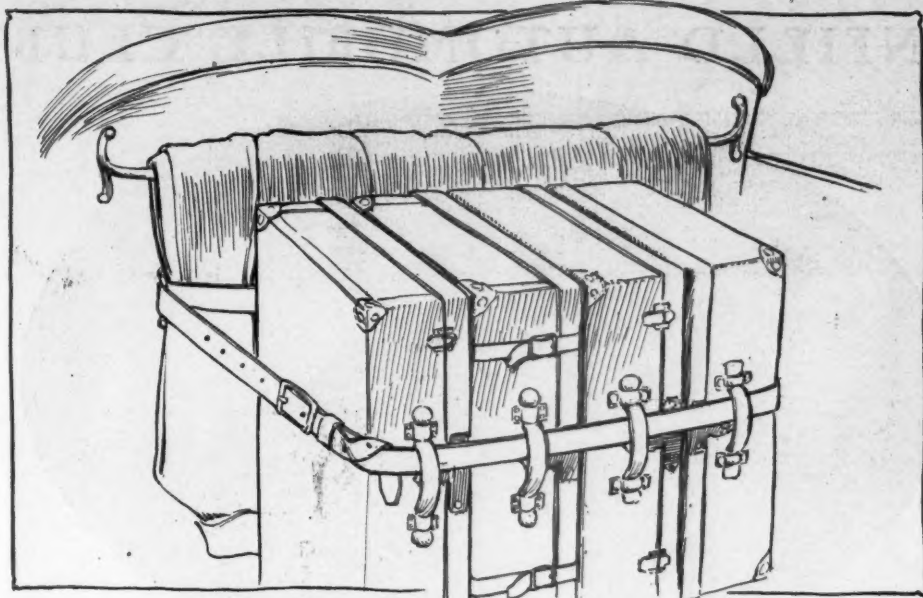
iron, a coil of solder and whatever soldering liquids are needed. This is essential in case of a small radiator leak.

Good Jack Necessary

See to it for the tire repair work that you have at least one good jack and that the handle is in place. The regular tire tools should be there, depending on the type of demountable or quick-detachable rim used. Of primary importance, in case tubes or air bottles are not used, is a good pump that is actually in commission. Cement and patching pieces are needed, for in best-regulated touring parties a streak



HAFAZARD LOADING OF BAGGAGE SPOILS A TOUR



PROPER WAY TO CARRY SUIT CASES IN A TONNEAU

of bad luck sometimes will drain to the last the supply of inner tubes.

Best Way of Carrying Parts

Having decided what are the necessary parts to take along, the next thing is to determine the best way of carrying them. If women are in the party avoid putting tools, tire tubes, jack or anything in the repair line under the tonneau seat, because every time those parts are needed it means having the women get out, and taking out the cushion in order to get at the tools. This is most inconvenient and the case is four-fold worse if the weather is wet or the sun too hot. All tools should be carried in a roll in a box on the running board, unless there is access to the space under the tonneau seat from the rear of the car. Do not mix the regular car tools with the tire tools. Carry the tire tools, jack, pump and extra inner tubes in the same compartment if possible. It is exasperating to upset the complete baggage arrangements of the car

simply to put in a new inner tube in case of a puncture. The complete peace of mind of the whole party is destroyed and the joy of the tour ended for a time. It is better to put the battery under the tonneau seat if it can be properly anchored and use the battery box on the running board for carrying some of the tools. If there is not enough room it may be that the tool roll can be strapped between the battery box and the frame of the car. It is quite possible to do this, particularly if a mudpan is inserted between the inner edge of the running board and the frame of the car.

Carry Spare Can of Oil

It is unwise to start out on a day's run of 150 miles without taking along a gallon can of motor oil. For one reason or another you may run out of lubricant: A drain cock may loosen and allow the oil to leak or you may encounter unexpectedly bad roads which require more oil. If you were to run out of oil in the country it is impossible to get lubricant that can be used in the motor. Grease, that will suffice for gears until a city is reached, can be obtained all through the country, but not so with oil. This extra can of oil should be carried on the running board and never in the tonneau. If there is no ordinary provision for such have a metal box attached to the running board and which box will accommodate a gallon or 2 of oil and perhaps a can of grease. If oil is put in the tonneau the can cannot be anchored and the oil will leak out and get on the floor covering and eventually on the clothes, destroying entirely the pleasure of the tourists, if they are at all fastidious on such matters. It is a part of a driver's duty to get dirty if necessary in making a repair, but that is no reason why everybody else in the car should be smeared with oil or grease.

Spare parts should never be mixed with tools or should these extra parts ever be thrown loosely on the tonneau floor, to wander whithersoever the jolts dictate.

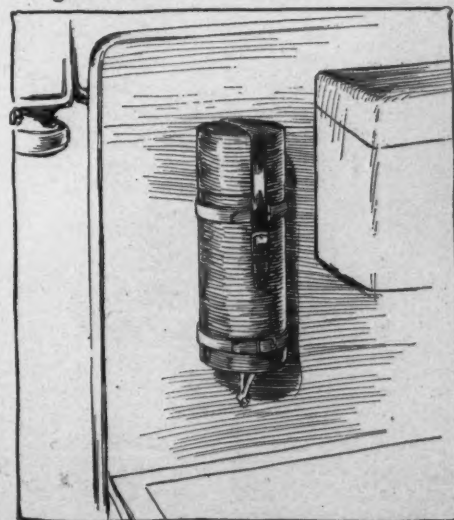
Spare parts should be kept in a place by themselves, and if this is impossible then put them in a heavy duck bag and tie the bag tight with a string. If you take delicate spare parts such as an extra breaker box on a magneto or a carbureter float or needle valve do them up separately in a bunch of waste and then wrap them in a separate piece of cloth. It is useless to take spare parts and then find them broken or injured when you want them.

Comforts for Touring

There are many features that might be called comforts in connection with a tour, and these specially administer to the pleasure of the entire party. The carrying of baggage is foremost in this respect. If baggage is not carried in special motoring trunks that are carried on the baggage racks on the rear of the car, then suit cases are the best solution of the case. In carrying suit cases, if there is room in the tonneau immediately in rear of the front seat this is the proper place for them to be. Four or five ordinary-sized suit cases can be stood on end across the car in the front of the tonneau and a special strap attached at either end of the coat rail will hold them in position. This is a desirable place to carry baggage if room permits, in that it is easy on the car. Where baggage is carried in the rear there is a heavy side whip if the roads are bad, which wrenches the car and makes it harder to steer. If suit cases have to be carried in the rear on the baggage rack, they should be carefully wrapped in oil-proof cloth to protect them from rain and dust. Nothing is more disagreeable than at the end of a run to discover the dust has permeated every part of a suit case that has been carried on the back of a car.

Carrying of Clothing

The carrying of clothing is equally important with that of baggage, and it is questionable if there is any better place than on the coat rail back of the front seat. Coats, rain, coats, etc. can be carefully folded and carried on this rail for days at a time without as much damage as being folded into a suit case.



CARRY THE THERMOS BOTTLE IN A DASH CASE



A CONVENIENT LIGHT FOR READING ROUTE

CLIMB OF PLAINFIELD AUTOMOBILE CLUB

Johnson's Drive, Used for Contest, Steeper than Dead Horse Hill and More Tortuous than Even Giant's Despair

NEW YORK, July 11—Over a course that is pronounced by experts to be far and away the most difficult in the east, the Plainfield Automobile Club of Plainfield, N. J., conducted its second annual hill-climbing contest Saturday afternoon. Good time was made in the ten events; not a mishap of any great consequence marred the pleasure of the day and good management and good weather combined to make the sport enjoyable to a crowd of well over 10,000 persons.

The hill is called Johnson's drive, but it never could have figured much as a pleasure speedway, for it is steeper than the Dead Horse hill at Worcester and more tortuous than Giant's Despair at Wilkes-Barre. Just short of 4,000 feet in length, there is not a stretch of 100 yards without its wrenching turn or heart-breaking grade. The total rise is only 300 feet, but it certainly seems much greater. The starting point is on level ground and the course is practically flat for 75 yards, then swinging around at right angles it mounts a stiff grade to a letter S curve that is so sudden that it makes the ordinary hairpin turn look like a straight line. Then comes almost a circle of heavy grade, followed by another rectangular turn and the finishing stretch is a little less than 100 yards of comparatively straight going.

The turns of the letter S curve were banked, which explains the fast time made on the general average. De Palma in the free-for-all did not keep his throttle open for longer than 10 seconds at any one time in making the record-breaking ascent. His huge motor, roaring like a lion, was opened and closed a dozen times during his trial and finished with a rattle of explosions



DE PALMA IN ARNOLD'S FIAT IN PLAINFIELD CLIMB

that sounded like a machine gun in action.

The day was perfect and long before the scheduled hour for starting, crowds assembled along the course. Practically every person in the big audience had a program, and remarkable to relate the running of the events was precisely in accordance with the terms of the program.

Five Hupmobiles and a Schacht competed in the first event, all finishing the course in creditable shape with the honors going to the Hupmobile owned, entered and driven by A. C. Dan in 2:04. On account of the size of the Hup, it was able to negotiate the sharp turns in commendable style. The Schacht, which appeared during the morning for final practice, stripped to the running gear, was required to replace the ordinary body of the car. The sudden changes in rig probably did the car no good in the running of the event.

Event 2 was taken rather easily by a Mitchell, but the running of the race was



MARTIN IN HUPMOBILE

marked by a bit of hard luck for the Oakland entrant. This car came whooping up the hill and was finishing about 10 seconds better than the time of the winner when the clutch began to slip and the motive power died out despite everything Howard Bauer could do, within 30 feet of the winning line. Buick 22 also participated in the tough luck of the hill-climbing game in this event. The car suffered two blow-outs on the first turn and could not finish.

Event 3 was captured by the Correja in easy fashion. During final practice this car suffered a broken front axle and the substitute piece was installed only a few minutes before the car was called to go upon the line. In its piston displacement class, the new front axle of the Correja snapped when the car was making the big



JONES IN BUICK NEGOTIATING A DANGEROUS TURN



WATCHED BY 10,000 EXCITED JERSEYITES



DEAN RANKIN IN CHALMERS, CONTENDER FOR TIME HONORS



LIBBEY IN THE HUPMOBILE

circle and Driver Joe Taylor had all he could do to keep the car from diving over the precipice. No one was hurt, however.

Event 4 was won by the Buick driven by veteran Phil Hines, who remarked after the race that in his 10 years of driving experience he had never encountered anything like Johnson's drive.

The class for the more costly touring cars did not fill and the next event was the free-for-all. E. W. C. Arnold's Fiat, driven by de Palma, broke the record for the hill by 8 seconds, finishing in 1:20. He had to make the big special car go at a record clip because two stock cars that finished behind him came so close that they also broke the former mark. These were the Chalmers driven by Rankin, which made 1:22½ and the Houpt-Rockwell of Stanley



Martin which made the climb in 1:22¾.

Event 9 produced a pretty fight. The Maxwell was the only entry up to a few minutes before post time when two Krits made post entry and just a few minutes before the race the little Buick that suffered the blowouts in its price classification race was thrown in. The result was that the Buick won by nearly 21 seconds, while the Krits fought it out for second place. Through a misconception of the rules for stock chassis classes which do not require the same load to be carried as those applying to the touring car divisions, a protest was about to be filed against the winner on behalf of the Krits which carried the full complement of passengers, but the matter eventually was explained to the satisfaction of all.

Event 10 was taken by the S. P. O. after the Correja broke its axle, and event 11 was won in astonishing style by the Chalmers entrant. This car had finished sec-

De Palma in Big Fiat Makes Fastest Time, But Is Close Pushed Up the Hill by Chalmers and Houpt-Rockwell

ond in the free-for-all and was generally looked upon as a sure winner, but in making the first turn, Rankin suffered a blow-out of the right rear show, despite which, however, he continued and managed to get across the line in 1:27¾, leaving him a winning margin of over 2 seconds.

Event 12 for cars with piston displacement of from 451 to 600 cubic inches found three contestants, a Houpt-Rockwell and two Stearns cars. The Houpt-Rockwell proved an easy winner in the same time it made in the free-for-all. The final number, an amateur event, brought out only the two Stearns cars that competed in the preceding number. The machine owned, entered and driven by C. B. Winslow got home in 1:28¾. Following the race program the club entertained the entrants at dinner in the clubrooms at the Brass Kettle inn. Summary:

CARS SELLING \$800 AND UNDER

| Car | Driver | Time |
|-----------|---------------|-------|
| Hupmobile | A. C. Dan | 2:04 |
| Hupmobile | E. B. Libbey | 2:09 |
| Hupmobile | R. D. Martin | 2:19¾ |
| Schacht | J. S. Gray | 2:21¾ |
| Hupmobile | E. D. Cutting | 2:22¾ |
| Hupmobile | R. E. Gillam | 2:28¾ |

CARS SELLING FROM \$801 TO \$1,200

| | | |
|----------|---------------|-------|
| Mitchell | W. Kettering | 2:03¾ |
| Maxwell | Hobble | 2:10¾ |
| Oakland | Howard Bauer | * |
| Buick | Charles Jones | * |

CARS SELLING FROM \$1,201 TO \$1,600

| | | |
|----------|-------------|-------|
| Correja | Joe Taylor | 1:40¾ |
| Mitchell | F. McCarthy | 1:57¾ |

CARS SELLING FROM \$1,601 TO \$2,000

| | | |
|---------|--------------|------|
| Buick | Phil Hines | 1:32 |
| Oakland | Howard Bauer | 1:35 |

FREE-FOR-ALL

| | | |
|----------------|----------------|-------|
| Flat | Ralph de Palma | 1:20 |
| Chalmers | E. Rankin | 1:22½ |
| Houpt-Rockwell | Stanley Martin | 1:22¾ |
| Buick | Beardsley | 1:33¾ |

160-230 CLASS

| | | |
|---------|---------------|-------|
| Buick | Charles Jones | 1:40 |
| Krit | Owen | 2:01¾ |
| Krit | Rodden | 2:03¾ |
| Maxwell | Hobble | 2:10¾ |



JOE TAYLOR IN THE CORREJA, WINNER OF EVENT 3

| 231-300 CLASS | | |
|------------------|------------------|-------|
| S. P. O. | J. Juharz | 1:31% |
| Correja | Joe Taylor | * |
| 301-450 CLASS | | |
| Chalmers | E. Rankin | 1:27% |
| Berkshire | Clapp | 1:29% |
| Bulck | Phil Hines | 1:31% |
| Bulck | Beardsley | 1:35 |
| 451-600 CLASS | | |
| Haupt-Rockwell | Stanley Martin | 1:22% |
| Stearns | Rutherford | 1:29% |
| Stearns | Winslow | 1:30 |
| AMATEUR CLASS | | |
| Stearns | C. A. Winslow | 1:28% |
| Stearns | J. A. Rutherford | 1:29% |
| * Did not finish | | |

ITINERARY OF SENTINEL RUN

Milwaukee, Wis., July 12.—President M. C. Moore, of the Wisconsin State Automobile Association, has issued an appeal to farmers living along the 780-mile route laid out by him for the first annual Wisconsin tour for the Milwaukee Sentinel trophy to give their earnest coöperation. The official schedule is:

Start, Hotel Pfister, Milwaukee, 8 a. m., Monday, July 18.—Milwaukee to Waukesha, Palmyra, Whitewater, Janesville, Brodhead, Monroe, Albany, Brooklyn, Oregon and Madison, night control.

Second day—Madison to Portage, Baraboo, Ableman, Reedsburg, LaValle, Wonewoc, Elroy,



SHOWING HOW TURNS WERE BANKED IN PLAINFIELD CLIMB

Kendall, Ontario, Cashton and La Crosse, night control.

Third day—La Crosse to Onalaska, Holmen, Galesville, Ettrick, Blair, Whitehall, Pigeon Falls, Osseo and Eau Claire, night control.

Fourth day—Eau Claire to Chippewa Falls, Cadott, Boyd, Stanley, Thorp, Owen, Curtiss, Abbotsford, Athens, Merrill, Wausau, Stevens Point, Waupaca, Weyauwega and Appleton, night control.

Last day—Appleton to Menasha, Neenah, Oakkosh, Fond du Lac, Oakfield, Waupun, Beaver Dam, Columbus, Watertown, Oconomowoc and Milwaukee.

Entries to date number twenty-four, all 1910 models excepting Rambler 64, which is a 1911 type. The list includes eighteen different makes, composed of two Ramblers, three Kisselkars, two Buicks, two Badgers and one each of Mitchell, Cadillac, Jackson, Pierce-Racine, Johnson, Ohio, Pope-Hartford, Reo, Corbin, Ford, Franklin, Overland, Staver, Petrel and Warren-Detroit. With such a field the Milwaukeeans expect that their reliability will be one of the great events of the year.

Harroun and Dawson Star at Louisville and Cincinnati

LOUISVILLE, KY., July 9—Rain today prevented the running of the second day's card at the local meet at Churchill Downs track and the events will be contested next Saturday. Cincinnati being scheduled for Sunday prevented a postponement until tomorrow. Yesterday nine well-contested events were run and there was only one accident in which anyone was injured. Harry Endicott, the E-M-F driver, was the sufferer in this, but he was not dangerously injured. In the second race, before the first mile had been negotiated, the car was hood to hood with the Cole entries when a heavy cloud of dust made it impossible for Endicott to see. The car left the track and dashed through the fence, crashing into the west wall of a stable.

Ray Harroun captured the biggest events of the day. The dirt track was slow because of recent rains and no records were

Emmons in a Herreshoff won the trophy in the fifth race, which was a well-entered handicap event of 5-miles. Every foot of the way was bitterly fought in the free-for-all handicap event. There were seven starters. Hughes carried off the first prize, when he negotiated the 5 miles in this race in 6:5.

A remarkable feature of the day's races was that throughout the nine events there was no tire trouble of any sort. None of the local contestants entered in the events could stand the pace set by the professionals, and they carried off no honors. Eugene Straus, president of the Louisville Automobile Club, was the official referee and representative of the contest board of the American Automobile Association. Summaries:

Five miles, for cars under 160 cubic inches piston displacement

| Car | Driver | Pos. |
|------------|-----------|------|
| Herreshoff | McCormick | 1 |
| Herreshoff | Emmons | 2 |
| Herreshoff | Smith | 3 |

Time, 6:45

Five miles, for cars 161 to 230 cubic inches piston displacement

| Car | Driver | Pos. |
|------|-------------|------|
| Cole | W. Endicott | 1 |
| Cole | Edmunds | 2 |

Time, 6:17

Five miles, for cars 231 to 300 cubic inches piston displacement

| Car | Driver | Pos. |
|------------|---------|------|
| Marmon | Dawson | 1 |
| Parry | Hughes | 2 |
| Black Crow | Stinson | 3 |

Time, 5:56

Five miles, for cars 301 to 450 cubic inches piston displacement

| Car | Driver | Pos. |
|----------|-----------|------|
| Marmon | Harroun | 1 |
| Marmon | Dawson | 2 |
| Stoddard | Gilchrist | 3 |

Time, 6:05

Five miles, handicap for cars under 300 cubic inches piston displacement

| Car | Driver | Pos. |
|------------------|----------|------|
| Herreshoff, 1:10 | Emmons | 1 |
| Parry, :25 | Hughes | 2 |
| Cole, :35 | Endicott | 3 |

Time, 6:27

Five miles, free-for-all

| Car | Driver | Pos. |
|----------|-----------|------|
| Marmon | Harroun | 1 |
| Marmon | Dawson | 2 |
| Stoddard | Gilchrist | 3 |
| Parry | Hughes | 4 |

Time, 5:49

Five miles, free-for-all handicap

| Car | Driver | Pos. |
|--------------|----------|------|
| Parry, :25 | Hughes | 1 |
| Marmon, scr. | Harroun | 2 |
| Cole, :25 | Endicott | 3 |

Time, 6:05

Twenty-five miles, for class A cars, 161 to 230 cubic inches piston displacement

| Car | Driver | Pos. |
|------|----------|------|
| Cole | Endicott | 1 |
| Cole | Edmunds | 2 |

Time, 31:42

Twenty-five miles, for class B cars, free-for-all

| Car | Driver | Pos. |
|----------|-----------|------|
| Marmon | Harroun | 1 |
| Marmon | Dawson | 2 |
| Stoddard | Gilchrist | 3 |

Time, 28:33

STILL WANTS FEDERAL BILL

Boston, Mass., July 9—President L. R. Speare, of the A. A. A., called the July meeting of the executive committee in Boston today and a number of important matters were discussed. The principal topic related to the passing of the federal registration bill, action upon which was expected by the last session of congress. It was decided to approve the bill and recommend its passage.

RACING AT CINCINNATI

Cincinnati, O., July 11—Motor enthusiasts held sway at the Latonia Jockey Club race track Sunday afternoon. The course was in fair shape, though the dust was heavy, despite the sprinkling brigade. The events, eight in number, were run in good time without serious accident. An added event was the special trial against time by Ray Harroun in a Marmon. Barney Oldfield's record, made 2 years ago, was :57%.

Motoring Big Feature of Week In Elk's Carnival at Detroit

Harroun lost a lot of ground on the turns but finished the mile in 1:02%. Johnny Aitken failed to show up with his National car, causing much disappointment until it was learned that he had broken down as a result of the strain following the death of his racing partner, Tommy Kincade, at the Indianapolis speedway. Summaries:

Five miles, for stock chassis under 160 cubic inches piston displacement

| Car | Driver | Pos. |
|------------|-----------|------|
| Herreshoff | Emmons | 1 |
| Herreshoff | McCormick | 2 |
| Herreshoff | Smith | 3 |

Time, 6:14%

Five miles, for cars 161 to 230 cubic inches piston displacement

| | | |
|-------|-------------|---|
| Cole | Endicott | 1 |
| Cole | Edmunds | 2 |
| E-M-F | H. Endicott | 3 |

Time, 6:11%

Five miles, for cars 231 to 300 cubic inches piston displacement

| | | |
|------------------|----------|---|
| Marmon | Dawson | 1 |
| Cino | Donnelly | 2 |
| Detroit-Deaiborn | Ramey | 3 |

Time, 6:00%

Five miles, handicap, cars up to 300 cubic inches piston displacement

| | | |
|-----------------|-------------|---|
| Marmon, scr. | Dawson | 1 |
| Herreshoff, :30 | Emmons | 2 |
| Cole, :20 | W. Endicott | 3 |

Time, 6:23%

Five miles, free-for-all

| | | |
|----------|---------|---|
| Marmon | Harroun | 1 |
| Marmon | Dawson | 2 |
| Matheson | Stevens | 3 |

Time, 5:23%

Five miles, free-for-all handicap

| | | |
|-----------------|----------|---|
| Herreshoff, :40 | Roberts | 1 |
| Marmon six, :05 | Dawson | 2 |
| Cole, :20 | Endicott | 3 |

Time, 5:50%

Ten miles, for cars 161 to 230 cubic inches piston displacement

| | | |
|-------|-------------|---|
| Cole | W. Endicott | 1 |
| E-M-F | Endicott | 2 |

Time, 12:50%

Ten miles, for cars exceeding 230 cubic inches piston displacement

| | | |
|--------|---------|---|
| Marmon | Harroun | 1 |
| Marmon | Dawson | 2 |

Time, 12:06%

Gilchrist in Stoddard and Stevens in Matheson also started, but quit on account of dust.

MOUNTAIN CLIMB AT MORRISON

Denver, Colo., July 11—Postponed from Saturday the Morrison hill-climb was held yesterday. Although a small field competed the contest was spectacular because of the dangerous course. The affair was promoted by John Brisben Walker and was at Mount Morrison. Owing to the picturesque and steep trail cut out of a mountain side for the climbing contest it is expected that Mount Morrison will gain fame throughout the country for the peculiar advantages offered for a severe test for motor cars. From the toll gate of the mountain reserve to the end of the climb the trail rises through rocks and canons for about 1 mile, the estimated ascent measuring more than 600 feet. Fred Alkire's Ford made the fastest climb, going up in 5:17%. Other class winners were: Inter-State, driven by King, 5:35; Oakland, MacDonald, 5:45; Ford, Thorney, 5:25%; Reo, MacDonald, 6:45; Oakland, Coby, 7:13%; Brush, Trinkle, 13:55. The free-for-all was won by Thorney in a Ford in 5:16, with a Reo second in 5:26%.

DETROIT, MICH., July 10—It is going to be a great week in Detroit; great for the Elks, who will be here 100,000 strong, and great for the motor car interests of the city, for at no gathering since the motor came into vogue has it been such an important contributing factor as it will be in the 1910 reunion of the country's antlered tribe. The motor parade scheduled for next Friday will prove an eye-opener to the visitors.

Robert K. Davis, of the Maxwell-Briscoe Detroit agency, is chairman of the motor committee, and he has been working for weeks on the details of the parade in the hope of making as fine a showing as possible. At first he figured on about 2,000 cars, but the present outlook is that there will be nearly 3,000 in line. As arranged, the parade will be about 20 miles long and will easily outdo anything of the kind ever attempted before.



INTER-STATE IN COLORADO'S MOUNT MORRISON CLIMB

The visiting Elks may have an opportunity to see just what these speed marvels can do under proper conditions before the week is over. Plans are under way for a series of exhibition matches at the Grosse Pointe race track as an added feature of the week's program.

The extensive grounds of the Detroit Athletic Club on Woodward avenue have

CLIMB AT McKEESPORT

Pittsburg, Pa., July 11—The sensation of the old home week celebration at McKeesport, Pa., was the hill-climb last Wednesday, this being the first event of the kind ever pulled off in the Tube City. The contest was over a hill course of 1 mile with three sharp turns. Ten cars were entered in the event. The best time was made by A. G. Somerville in an Inter-State—1:41.

been taken over entire by the General Motors Co. and a whole city of tents has been erected to take care of cars manufactured in General Motors plants and owned by visiting Elks. No charge will be made for this accommodation and there is ample room. The Elks express great appreciation of this courtesy on the part of the company.

The Grabowsky Power Wagon Co. has tendered the Elks the use of a special sight-seeing car during the reunion.

For the relief work of the ambulance corps that will be on duty during the convention the Hudson Motor Car Co. has tendered twelve machines and will supply more if they are needed, it is announced. A Hudson touring car has been donated as the first prize to the women making the finest showing in the grand parade next Thursday afternoon.

BARRED FROM BOSTON PARKS

Boston, Mass., July 11—Boston motorists were much disturbed today when they read in the papers that the Boston park commis-

sion has made a ruling that such roads as were hertofore opened to motor cars had been ordered closed at the request of Mayor Fitzgerald. If the ruling is upheld by the state highway commission it means that motorists will have to go out of their way in many instances coming in to Boston and going out, for some of the parkways lead directly to other nearby cities and towns. This is the outcome of the agitation last spring by Mayor Fitzgerald to get 25 per cent of the fees from motor cars for the maintenance of the park roads in Boston. The legislature will have to act before any sum can be set aside, however. The matter is now placed squarely up to the state highway commission, for the rules cannot be enforced until the commission approves of them. So a hearing has been set for July 27, when the whole matter will be thoroughly discussed.



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The Cars For Next Year

FOR more than a month the various announcements of 1911 models have been appearing and now sufficient information is at hand to indicate, in a fairly general way, what the trend is to be in the matter of style and manufacture for the coming season. From points that have been under discussion during the past 12 months it is natural to expect evidence of the long-stroke motor but although the real long stroke is not here yet it is on the way. This is shown by some concerns which this year have had motors with cylinders $4\frac{1}{2}$ inches square but for next year the bore has been left alone and the stroke lengthened to 6 inches. There are many other companies who are adding from $\frac{1}{4}$ to $\frac{1}{2}$ inch to the stroke and not altering the bore. It is difficult to say whether it is disappointing or not that more has not been done in the matter of lengthening the stroke and particularly with the old and well-established companies, although special activity is shown among the smaller builders and particularly among the younger concerns. This may be answered by a comparison with the European situation. In Europe the big trends toward long strokes and greater motor efficiency did not exhibit themselves until the slump came in the market two seasons ago. When the slump came it was a case of scurry for business and then the makers began to talk efficiency for a certain motor size and weight.

A PART from the motor situation in regards to ratio between bore and stroke there is a healthy advance all along the line. Concerns who have been marketing high-priced cars for several seasons have in many cases made scarcely a change but with the middle class the step-up pace is everywhere evident. The higher-priced magneto is exhibiting itself in several factories where it was unheard of before; and the higher-priced carbureter is following in its wake. There is a noted dropping of the old cup-and-cone ball bearing for the annular ball type or the adjustable roller type; there is on every hand a sign of closer study of rear axle construction with a necessary strengthening in many makes of cars as well as an improvement by adding more efficient bearings. The trend of the times is also shown in the matter of springs, improvements in the three-quarter rear type being apparent in many factories where heretofore the semi-elliptic has been considered the acme of satisfaction. Not only has the three-quarter gained but many makers have been experimenting with it and not a few adaptations of it are now on the market. As might be expected there has been a wholesale addition to the fitting of grease cups on medium-priced cars. Makers who heretofore have not fitted a grease cup on spring bolts now attach adequate ones and are adding them to many other parts of the car as well.

PERHAPS the body design will show greater improvements next season than ever before. This will be essentially a year of torpedo types and of conventional bodies with the front or fore doors fitted. It is apparent that nearly every maker has realized the improvement of the front door for winter work but there is a feeling that it is hotter for summer travel. In order to meet this objection one maker has devised a type of front door with supporting parts, which can be removed in summer, leaving the car an ordinary type and one in which the removal of the doors could scarcely be detected. This is a clever scheme if it is accepted that a front door is too hot.

Influence of the Grain Crop

PERHAPS nothing indicates better the fact that the farmer has become a consumer of motor cars than that the recent drought throughout several of the western states has caused a perceptible slump in the sale of motor cars; and as a direct result many of the manufacturing concerns have delayed the announcement of their 1911 models until the last models of the 1910 line have reached their destinations. The time has come when motor car manufacturers will have to watch the crop bulletins just the same as other makers and dealers have to. A good crop any year means that the farmers will buy cars that year, whereas a poor crop is a sure indication that there will be a slump in the market. The buying propensity of the farmer is in direct proportion to the crop and the prices. It is a fact that with farmers they are ready and immediate spenders. If the crop is partially harvested early in July, as in southern Oklahoma and Texas, and the grain immediately taken to the elevator, that farmer is at once in the market for a car or for any line of agricultural machinery which the agent may convince him he is need of.

THE catering to the farmer will be more of a factor in coming years than it has been to date. Already many manufacturers have begun comprehensive advertising campaigns appealing specially to farmers and the plan of operation is a sensible one, the maker following along the line of the maker of agricultural machinery who has been appealing to these classes for a decade or two. This is a healthy indication in the industry and the makers will find as ready a response from farmers as they have from any other class. The point has frequently been discussed as to the ability of the farmer to keep a car in running commission and in this connection many builders of cars have claimed that only the simplest type of car would be sold to the farmer. This is wrong. As a matter of fact the farmer is better fitted to keep a car running than 60 per cent of the city owners. The farmer is at home with machinery. He has used it every year since he began farming and has become accustomed to keeping it in repair and making many of the repairs himself. He is the most independent individual in the world when it comes to shifting for himself in case of a trouble. Not being next door to a repair shop, garage or blacksmith shop, he has learned to help himself and so through his years of experience with farm implements has developed a most commendable spirit of independence in the matter of repairs, which fits him admirably for the ownership of a motor car. Makers can at once dismiss the fear that the farmer will not be able to care for his car. Those who own them already have borne out this claim. The farmer is well fitted to do his own work and it will not be a worry to him if he is 12 or more miles from the nearest garage. To assist in the farmer situation there is growing up in the country districts and in villages and small towns a superior class of blacksmiths, workmen who are familiar with the differences in steels and who through their bowing acquaintance with the bicycle have learned that nicety of workmanship which is imperative in a car. The coming of the car among the farmers is going to accentuate this condition so that by the time the business with the farmer is in full swing from the Atlantic to the Pacific all problems regarding repairs will have been settled and the farmer will have scarcely a reason to offer why he cannot be the owner of a car. This suggests the time when the car will form a part of the exhibit at the country fair.



The Motoring Calendar

July 16-18—Reliability tour and hill-climb of Motor Contest Association of New York.

July 18-23—Milwaukee Sentinel trophy. Tour of Wisconsin State Automobile Association.

July 20—Secret-time run of Syracuse Automobile Club for Watson trophy.

July 22-27—Second annual endurance run of Minnesota State Automobile Association.

July 22-27—Second annual tour of Minnesota State Automobile Association.

July 25-28—Reliability run of Cleveland Automobile Club, Cleveland, O.

July 23—Meet on speedway at Atlanta, Ga.

July 28-29—Third annual interclub reliability team match between Chicago Automobile Club and Chicago Athletic Association.

July 30—Track meet of North Wildwood Automobile Club, Wildwood, N. J.

July 30—Inaugural sweepstakes meet on Long Island motor parkway.

August 1—Reliability run of Minneapolis Automobile Club, Minneapolis, Minn.

August 1-September 15—French Industrial vehicle trials.

August 4—Annual hill-climb of Chicago Motor Club at Algonquin, Ill.

August 6—Track meet of Quaker City Motor Club, of Philadelphia.

August 15—Start of Munsey tour.

August 17—Track meet at Cheyenne, Wyo.

August 26-27—Road races of Chicago Motor Club at Elgin, Ill.

September 2-3-5—Speedway meet at Indianapolis.

September 3—Reliability run of North Wildwood Automobile Club, Wildwood, N. J.

September 5—Track meet at Wildwood, N. J.

September 5—Track meet at Cheyenne, Wyo.

September 5—Road race of Denver Motor Club, Denver, Colo.

September 5-10—Track meet at state fair, Minneapolis, Minn.

September 7-9—Four-day reliability run of Automobile Club of Buffalo.

September 9-10—Track meet at Providence, R. I.

September 10—Automobile Club of San Francisco road race, Golden Gate park.

September 10—Mount Baldy road race, Los Angeles, Cal.

September 10-11-12—Track meet at Seattle, Wash.

September 17—Track meet, Syracuse, N. Y.

September 18—Track meet at Syracuse, N. Y.

October 1—Vanderbilt cup race.

October 3—Reliability run of Louisville Automobile Club, Louisville, Ky.

October 7-8—Speedway meet at Los Angeles, Cal.

October 6-7-8—Track meet at Santa Anna, Cal.

October 8—Fairmount Park road race, Philadelphia, Pa.

October 15-November 2—Show in Paris promoted by Aeronautical Society.

October 15-16-17-18—Annual 1,000-mile reliability run of Chicago Motor Club.

advantages of each; single versus dual versus en bloc cylinder construction—the advantages of each. Three versus five versus two-bearing crankshaft construction. Die-cast versus sand-cast bearings. Effect of T-head motor construction on fuel consumption. Is the valve-in-the-head motor more difficult for the novice to operate? Valve-seat angles. Cast iron valves. "Ill-Smelling and Unsightly Exhausts," F. D. Howe. Foreign matter in commercial gasoline. Chemical decarbonizers—are they safe and effective? Motor noises. Helical timing gears. Carbureters. Proper proportioning of cooling systems. Motor lubrication. Fitting piston rings.

Friday evening—Dinner at Light House Inn, participated in by the women accompanying those attending the convention.

Saturday, 9 a. m., professional session—Discussion of commercial vehicles, including an address on "Standardization of Wheels and Tires," by J. M. Mack, and a paper on "Application of Motor Trucks to Railroad Service," by T. V. Buckwalter.

Saturday, 1 p. m.—Professional session, in which some thirty or more pertinent subjects will be discussed.

ATLANTA'S NEXT CARD

Atlanta, Ga., July 9—With a sanction granted for July 23 and with a tentative schedule of events drawn up, the Atlanta Speedway Association is soliciting entries for a local speedway meet to be held on the speedway track. The program includes fifteen events and offers a good variety. The races range in length from 2 miles to 20 and include offerings for all classes from the smallest to the free-for-all. One of the chief events will be a race for the amateur championship of Georgia. The prizes in this event and all the rest will be cups.

October 20-21-22—Speedway meet at Atlanta, Ga.

October 23—Road race, Portola cup, San Francisco, Cal.

October 27-28-29—Track meet at Dallas, Tex.

November 5-6—Track meet at New Orleans, La.

November 6-9-13—Track meet at San Antonio, Tex.

November 24—Hill-climb at Redlands, Cal.

November 24—Road races at Savannah, Ga.

December 1-8—First annual aeronautical exhibition, Chicago Coliseum.

December 3-18—Annual salon of Automobile Club of France.

January 7-14 and 17-24, 1911—Show of A. L. A. M., Madison Square garden, New York.

February 6-11 and 13-20, 1911—N. A. A. M. show, Chicago.

Suit Started in Mexico

Shows Profit in Guayule

Alpine, Tex., July 9—In a suit just filed in the district court at San Antonio for an injunction against the Texas Rubber Co., the Big Bend Mfg. Co. and William H. Stayton of New York by Otto Koehler of the former city to restrain the defendants from selling any guayule shrub gathered from 12,000 acres of land in this county, the allegation is made that an enormous quantity of this shrub from which approximately 223 tons of guayule rubber, valued at \$223,000, has been manufactured, has already been gathered from the 12,000 acres in question.

According to the statements contained in the petition in this case, the guayule rubber industry in Texas is enormously profitable. It is set forth by Mr. Koehler that he formerly was the owner of all the stock of the Texas Rubber Co., which had a rubber manufacturing plant at Marathon, this county, and the right to cut the guayule shrub on 12,000 acres of land. He also had contracts to cut guayule upon other lands of this section. He says that he entered into a contract with Mr. Slayton, who owns the stock of the Big Bend Mfg. Co., to sell him his interest in the Texas Rubber Co. for \$50,000 cash and \$150,000 of bonds of a new company to be organized by Mr. Stayton, and which was to issue \$400,000 bonds. It was further provided in this contract that out of the proceeds of each ton of guayule rubber sold \$150 was to go into a sinking fund to retire these bonds, the \$150,000 held by Mr. Koehler to be paid off first.

It is alleged by plaintiff that the new company never was organized or the bonds issued, as provided in the contract, but Mr. Stayton assumed control of the valuable property and has gathered shrub from the 12,000 acres and manufactured therefrom approximately 223 tons of rubber, which he sold for at least \$1,000 a ton. He alleges that no money has been placed in a sinking fund to pay the debt due him. He asks for an accounting and the appointment of a receiver to take charge of the property.

Interesting Program Made Up by Motor Engineers

Detroit, Mich., July 12—The mid-summer session of the Society of Automobile Engineers, which takes place at Hotel Tuller, Detroit, July 28, 29, 30, promises to be of special interest because of the comprehensive nature of the papers which are to be read at that time. President Howard E. Coffin has made the announcement that the society extends an invitation to all motor car engineers, whether they are members of the society or not, to be present at any and all sessions of the society on the above dates. The program of events for the 3 days is as follows:

Thursday, July 28, 9 a. m.—President H. E. Coffin's opening address: "The Aims of the Society and the work in Hand." Report of tellers of election of members. Treasurer's report. Subject for discussion: "The Society of Automobile Engineers. Its future intentions and the benefits to be derived by its members." "Lines along which the Society of Automobile Engineers may be of greatest benefit to its members individually and to the motor car industry."

Thursday, 2 p. m., professional session—"Specification and Heat-Treatment of Motor Car Materials," Henry Souther. "Testing the Hardness of Metals," A. F. Shore. "Demonstration of the Scleroscope," H. G. McComb. Report of committee on gear steels, G. W. Sargent, chairman. Standard gauge, sizes and chemical composition of sheet metals. Standard sizes of seamless steel tubing. Standardization of control mechanism, position of speed notches and actuation of planetary gear pedals. "Nomenclature of Motor Car Parts," F. E. Watts. "Test Data on Frame Sections," L. R. Smith. "Cork Insert Pulleys for Motor Vehicle Manufacturing Machinery," L. Whitcomb.

Thursday, 7 p. m., society dinner, followed by professional session.—Report of committee on tire efficiency, F. J. Newman, chairman. "How to Make Gears Quiet by Grinding," Mr. Moore. "The Pyrometer: Its Development and Use," W. H. Bristol. "The Variation in Current Practice in Anti-friction Bearings," D. F. Graham. The propeller shaft brake versus double brakes on rear wheels. Brake materials. "Proposed Court of Patent Appeals," E. J. Stoddard.

Friday, 9 a. m.—Visits to manufacturing plants. Members to elect three of the plants which they individually wish to visit; visiting parties to be grouped accordingly.

Friday, 1 p. m.—The members will be the guests of the Timken-Detroit Axle Co., for luncheon and a boat trip in the afternoon, during which there will be as subjects for discussion: "The Proper Basis for Taxation of Motor Vehicles," Charles Thaddeus Terry, legal adviser of the American Automobile Association. "Test of a 20-horsepower Franklin Air-Cooled Motor," conclusion of paper by L. R. Evans and R. P. Lay. "Gas Engine Valves and Their Action," Eugene Batzell. Long versus short-stroke motors—the advantages and dis-

Prince Henry Benz Best in Climb

BRUSSELS, June 25—Otto Heim, driving one of the specially constructed Prince Henry tour Benz touring cars, was the winner of the sixth annual contest for the Meuse trophy. The event was a hill-climb over the Bethane-Baraque St. Michel course of 8 miles, and the winner made the ascent in 8 minutes 8 seconds, which is, however, far from approaching the record of 7:25%.

This annual Belgian event is one of the very few contests of international importance still on the European motor calendar of sporting events. This year more than sixty entries were received, but had the promoters been a bit wiser and arranged the climb for a few days later, so as to give time to the German manufacturers, who had all taken part in the Prince Henry tour, which was hardly over then, instead of the forty starters there would have been a score more. As it was, all the German cars excepting the Benz and a Mercedes—the latter owned by a Belgian—were missing. France was well represented only in the class for racing cars, in which the Lion-Peugeot team was all by itself to fight it out for honors. Last year's winner of the climb, the Swiss car Martini, also started, and in addition there were some twenty-five Belgian cars.

A more appropriate course to hold a climb in this country hardly could have been chosen from a scenic point of view. The country is rich in soil, steep hills, valleys, in old and new chateaux and churches. The roads are among the finest in the land, and within less than 5 minutes' railroading one is beyond the border line and in Germany. But in this part of the country it often happens that the fog is so dense and remains so long that the sky does not get clear until late in the afternoon. So it was on the day of the climb, and but for the good organization it would have been difficult to have started all the cars. As it was, the last cars started when the night was approaching.

The 8-mile course, leading up to the Baraque St. Michel, which is Belgium's highest located land, started within the garden of the Hotel de Bethane, where the road is level. Within less than 150 yards the actual hill begins, and about 50 yards further the gradient is 12 per cent. The first turn is less than $\frac{1}{8}$ mile from the starting place, and in the midst of the wood through which the route leads all the way. After less than $\frac{1}{4}$ mile the gradient falls to 5 per cent, then up to 9, 10 and 11, and then a drop again to 5. Half a mile further it's 10 to 12 per cent, and then during several miles the gradient averages not over 5 per cent, with long stretches of excellent going and few turns. Then, after a pretty sharp turn, the route is again pretty steep, 9 to 12 per cent for a mile, followed by a long stretch without turns. The last 2 miles are steeper, and the finish

is reached upon a level stretch of road.

Like last year, the cars were at first divided into three general classes, namely, racing cars, touring cars and closed cars. Each class was sub-divided into two classes according to the motor's fuel capacity, the cars with engines holding less than 3.8 liters—1 gallon—being in class 1, and those holding more than 3.8 liters in class 2.

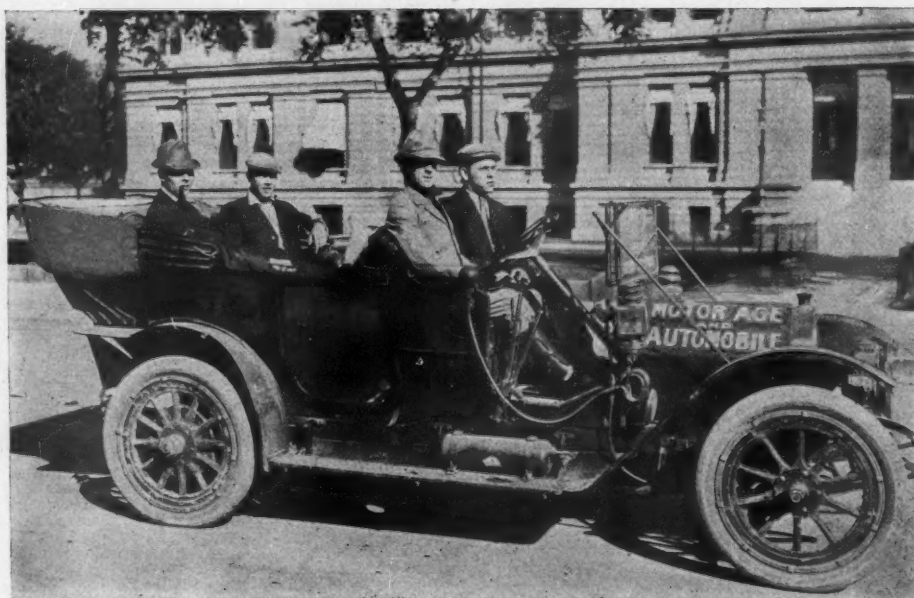
Speed was by no means the principal deciding factor as to the winner. The classification was made by taking into consideration four items—the car's weight, the distance in meters covered per second, according to the average of the speed during the climb, the motor's cylinder capacity and the time. The first two items were added and then divided by the two other items, which were multiplied.

Four cars attracted the special attention

of the representative crowd—the Benz and the three Lion-Peugeot racers. The German car, with its torpedo-shaped body, its spectacular rear, which looked like the end of a Lusitania or Mauritania, and its little 4.1 by 6.5 four-cylinder motor and its protected wheels was taken by ninety-nine out of a hundred motorists as a conception of a racing car. As for the undefeated little Peugeot one and two-cylinder cars, they were by themselves.

The Meuse trophy contest is now the oldest annual event on the Belgian motor-ing calendar. It originally was a regularity contest, being run for the first time in 1904, over a course of 58.8 miles. There started nineteen cars and four motor cycles. In 1906 the distance was increased to 77.5 miles, and there were forty-two cars at the start. In 1907, for the first time, there was a double event, as in addition to a regularity run over a course of 39.8 miles there was a hill-climb, the first

Scenes Incident to the Denver Run



MOTOR AGE CHALMERS CAR IN DENVER POST RUN



ARRIVAL AT ROCKY FORD, HOME OF FAMOUS WATERMELONS

event being in reality an elimination race, as only those cars which scored a certain number of points in the regularity event were allowed to start in the hill-climb. In 1908 the event was not held, and last year the winner from among forty-four starters was the little Martini, weighing only 1,549 pounds, with a four-cylinder motor 2.5 by 3.5. Summary:

FOUR-CYLINDER CARS

| Car and driver | Bore | Stroke | Time |
|----------------------|------|--------|--------|
| Benz, Helm | 4.1 | 6.5 | 8:02 |
| Springuel, Springuel | 3.5 | 4.7 | 9:18 |
| Germain, Bourland | 3.6 | 4.3 | 10:30 |
| Imperia, Heussen | 3.5 | 4.7 | 11:08% |
| Le Gui, De Tornos | 2.5 | 4.3 | 13:58 |
| Minerva, Rickens | 4.9 | 5.1 | 8:55 |
| Imperia, Maes | 2.95 | 3.9 | 14:56% |
| Imperia, Hublin | 3.5 | 4.7 | 12:11 |
| Imperia, De Gulse | 4.1 | 5.1 | 10:18 |
| Nagant, de Woelmont | 3.5 | 4.7 | 10:56% |
| D-F-P, Bastin | 3.3 | 4.7 | 13:26% |
| Minerva, Dehon | 3.2 | 4.3 | 14:25% |
| Imperia, Klintkamers | 3.5 | 4.7 | 16:09% |
| Imperia, Sauveur | 3.5 | 4.7 | 11:40 |

ONE AND TWO-CYLINDER CARS

| Car and driver | Cyl. | Bore | Stroke | Time |
|------------------------|------|------|--------|-------|
| Lion-Peugeot, Giuppone | 1 | 3.9 | 9.8 | 9:29 |
| Lion-Peugeot, Boillot | 1 | 3.9 | 9.8 | 9:43% |
| Lion-Peugeot, Goux | 2 | 3.1 | 7.9 | 9:53% |

British Maker Meets Sudden Death

LONDON, July 12—Captain Charles Stewart Rolls, one of the leading motor car manufacturers of Great Britain and undoubtedly one of the greatest sportsmen in the world, proficient in motoring, football, aviation, ballooning and the like, met a sudden death today at Bournemouth when he was killed in a fall of his biplane in which he was flying. Accounts differ as to just what caused the accident, but the fall was at least 100 feet. Captain Rolls was buried in the debris and died soon after being extricated.

This young Englishman was but 33 years of age, but at the time of his death he was one of England's largest car manufacturers. Head of the firm of C. S. Rolls & Co., he had placed on the market the Rolls-Royce, a car which is regarded as one of the leaders. Even before this he

had been a pioneer in motoring. He had participated in the Paris-Madrid, Paris-Berlin, Paris-Vienna, Paris-Ostend and Paris-Boulogne races in the earlier days of the sport and in 1905 he drove in the Gordon Bennett cup race as a representative of Great Britain. In 1900 he won a gold medal in the famous 1,000-mile test and in 1906 he distinguished himself by running second in the Tourist trophy race in a 20-horsepower Rolls-Royce. The Rolls-Royce was exhibited at a recent New York show and Captain Rolls was in attendance, devoting considerable time to investigating motoring conditions in this country.

Captain Rolls was the third son of Baron Llangattoek and was educated at Eton and Trinity college, Cambridge, specializing in practical electricity. At college he was captain of the bicycle team and graduated in engineering, winning a M. A. degree in 1902. He became interested in motoring in 1896 and drove a car previous to the abolition of the red-flag regulation. When ballooning came in he became an expert at that and naturally graduated into the aviation field in which he distinguished himself by being the first one to fly across the channel and back, making the flight from Dover to Calais and return without a stop only a short time back.

DENVER POST AWARDS

Denver, Colo., July 9—The judges in the recent Denver Post reliability run have filed the following report: Winner, Rambler, driven by E. R. Cumbe; E-M-F, second. Class winners, 20-mile division—Buick; Buick, second; 18-mile division, E-M-F; Regal, second; 16-mile division, Hupmobile. Final score of cars: Rambler, 2; E-M-F, 3; Buick, 4; Studebaker-Garford, 21; Haynes, 24; Apperson, 24; Renault, 46; Jackson, 56; Hupmobile, 69; No. 15, Paige-Detroit, 103; No. 18, Paige-Detroit, 138; Regal, 353; Firestone-Columbus, 582; Reo, Flanders and Gleason, withdrawn.

MORE OF THE PARKWAY OPENED

New York, June 11—The newly-completed section of the motor parkway was thrown open to the motoring public last Saturday, the stretch including the road between Meadow Brook lodge and Great Neck. On this strip the cement idea has been abandoned, and instead is used a tar-coated gravel road which has a concrete base several inches thick. All highways are crossed above or below grade and curves have been banked involutely so that a saucer effect is secured. It is on this stretch that the inaugural sweepstakes meeting will be held July 30. This will give the public an idea of the speed of the course that will be used for the Vanderbilt on October 1 and the grand prix on October 15. Three Marmon cars have been named for both these classics.

Scenes Incident to the Denver Run



BRUSH RUNABOUT, OFFICIAL CAR IN DENVER RELIABILITY



DENVER CARS PARKED AT CHEYENNE WELLS INTERESTS NATIVES



ONE OF THE BEAUTIFUL DRIVES FOUND IN KEARNEY PARK

Kearney—A Beauty Spot

*H*AD Columbus lived in this day and age, and had he gone to Fresno with a motor car, the first thing he would discover would be Kearney drive and park. Not that Kearney drive and park are not fairly well known, but not one-hundredth of the people know about it that should.

Starting from the city limits of Fresno, and from a town that is supposed to produce nothing but ball players and raisins, is one of the most beautiful drives in the whole world, at the end of which lies a park that for its size has no equal in the United States. This drive and park were planned, planted and financed by M. Theodore Kearney, an eccentric bachelor, who, with unlimited funds and with a total disregard of cost, spent the better part of his life in its execution. The drive is 9 miles long between rows of stately trees and waving palms, traverses one of the most fertile sections of the estate and is bordered by orchards and vineyards. There is something to catch the eye every foot of the way. Stationed at the gateway of the park is a keepers' lodge, overgrown with ivy and climbing roses, which, did it exist in Europe, would be noted in every guide book.

The park proper consists of 160 acres, in which it is said that every tree, vine and

By A. C. Wheelock

shrub known to man is grown and, what is more, mostly out of doors. One of the best landscape gardeners in the world, the man who laid out the Golden Gate park, was employed to design and plant it in a soil and climate unequalled for rapid growth. It is a place where every lover of the out-of-doors can be happy. In the year of his death Kearney planned a Swiss chateau that was to occupy a prominent place in the park, and which was to cost a fabulous sum.

The estate was left to the state university and is now in its charge, and it is hoped that it will continue with the work that will some day astonish the world. Kearney perhaps was as eccentric a man as was ever known, he had no friends and did not want any. It is said that no man ever ate at the same table with him. He never gave an order directly to an employee and more than one laborer lost his job on the estate by so far forgetting himself as to say "good morning" to Kearney.

When you travel through California keep this in mind, that whatever you may or may not see, let your road lead to Fresno and you will be well repaid.



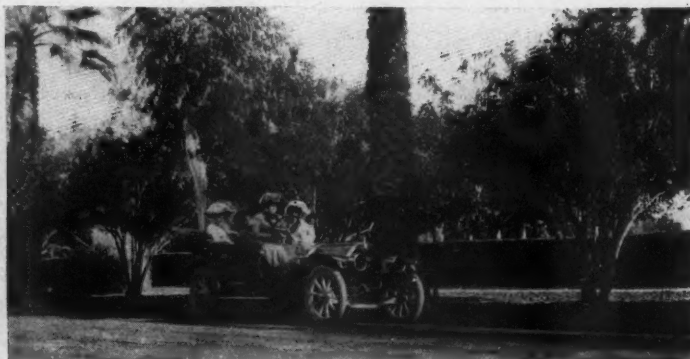
KEARNEY PARK DRIVE



ON GLIDDEN TRAIL IN MINNESOTA



ROSE GARDEN IN KEARNEY PARK—WEEPING WILLOWS IN BACKGROUND



CALIFORNIA SCENERY—A STOP AT FARM HOUSE NEAR FRESNO



EUCALYPTUS FOREST IN KEARNEY PARK



SEEP MUD FOUND IN THE OZARKS



MISSOURI TOURISTS PREPARING A ROADSIDE BREAKFAST



ALONG THE DRIVE IN KEARNEY PARK AT FRESNO, CALIF.

Call of the Confetti Trail

By C. E. Fulton

FASCINATING stories of motor tours inculcated an idea in our family that a month's journey in the car would be about as pleasant a summer vacation as we well could spend. The route decided upon was from our home, Springfield, located on a high plateau of the Ozark mountains in southwest Missouri, to St. Paul, Minn., and return. The preparations and loading the car the evening before the start were not completed till near midnight; then, after a pretense at sleep and a purely ceremonial breakfast, we got away August 14, before it was light enough to see the road plainly.

The car has a seating capacity for five; is rated at 20 horsepower, and in it and strapped to its running boards we carried two suit cases and a telescope valise, a linen bag full of towels and other useful articles; a box of cooking utensils; a provision box; a medicine chest; a tent; blankets; pillows; a full quota of tools, a rope, an axe, a canvas bucket, four extra inner tubes, three extra casings, and a tire repair kit. We screwed a half-dozen small hooks into the under side of the top-bows, and on these hung a small hammock, like those in the Pullman upper berths. This proved a handy

receptacle for hats and other light articles. The boy, 15 years old, did the driving. His father studied the map, inquired directions, did the cranking, and when we met fractious horses or mules led them by the car.

The route usually taken by motorists from Springfield to Kansas City is rather circuitous, about 260 miles in extent. We took a more direct one, 40 miles shorter. Going west 20 miles we crossed the Turnback river, and because of the series of flint hills just beyond convinced us it was appropriately named. We are accustomed to some rocks, but this was a case of all rocks for 6 or 8 miles, and further on we found the rocks in low piles with intervals of smooth road between. Gradually these grow farther apart until we reached the town of Lockwood, 55 miles from home by odometer, and here we came out upon a smooth prairie road which we followed west through the towns of Golden City and Lamar, and then north to Nevada, 108 miles from home, where we arrived at 5 p. m. We made a late start the second morning, losing our way once during the forenoon, but reached Independence, Mo., at 10 p. m., 221 miles from Springfield, and 12 miles from Kansas City. Our route from Nevada to Independence was through Rich



IDEAL CAMPING SPOT FOUND AT PANORA, IOWA

Hill, Butler, Harrisonville and Lee's Summit. We left there late in the forenoon of August 19, our third day on the road, taking dinner at Leavenworth. We found rough, hilly roads from Leavenworth to Atchison. At this point we crossed the river into Missouri and camped at Rushville, 295 miles from home.

The fourth day of our tour we passed through St. Joseph, Savannah and Maryville, Mo., and camped, by permission, in a farmer's orchard, a few miles from the Missouri-Iowa line. We only made 79 miles this day, having been stuck in the mud the greater part of the afternoon, until a good Samaritan with two noble Missouri mules came to our rescue. This was a peculiar mudhole half way up a great hill. On the rest of the hill the road was smooth and dry. We found these boggy places on hillsides quite frequently in northwestern Missouri and southwestern Iowa. The people in that locality call them seeps.

The next morning we soon were in Iowa, and passed through the towns of Bedford, Gravity, Corning and Prescott during the day. By this time we had taken such a liking to camp life that we did not stop at hotels for any of our meals and seldom for lodging. We cooked dinner by the roadside at any convenient place, and always obtained permission from the farmers to drive into a lot or field where we could find shade and water, and be off the public road to camp for the night.

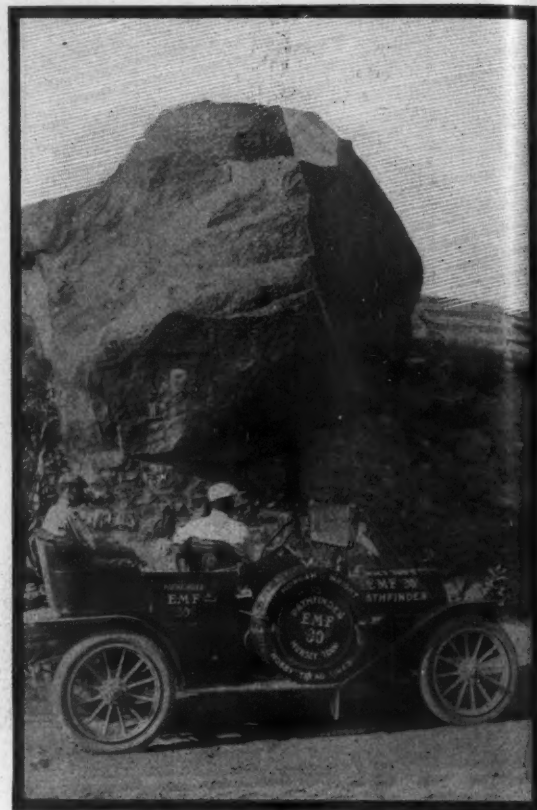
The following day was Sunday, and there had been some debate as to whether we should travel. My wife, true to her New England bringing up, entered a protest, but was voted down two to one. A compromise was agreed upon, to drive slowly and not cut out the muffler, but we had not gone far when a big black cloud that had been gathering over night produced an argument which settled the question in favor of the minority. There may be cars that will travel in black gumbo during a rain, but ours was not that kind. We stopped near a country church that had been abandoned for some months, and obtained permission from the parson who lived near to use it for a shelter. So we not only did not travel on Sunday, but went to church and stayed all day and all night. The mice were so numerous and kept up such a scampering over the floor and empty pews during the night, that my wife, ordinarily fond of church, was glad of a daylight start next morning. This day was to go down on our log-book as muddy Monday. The rain had ceased at 2 p. m. the day before, but the mud was so sticky that we only traveled 3 miles the first hour. As the sun rose higher and a southwest wind set in, the mud became drier and we gained speed. We passed through Nevinsville and stopped at Greenfield for dinner. In the afternoon we passed a mile west of Menlo. The next town was at Monteith, on the Raccoon river. We went from here to Panora on Willow creek, and camped for the night. This was the most beautiful camping place we found on the entire trip. Owing to the mud and

Pathfinders in E-M-F Finish Task of

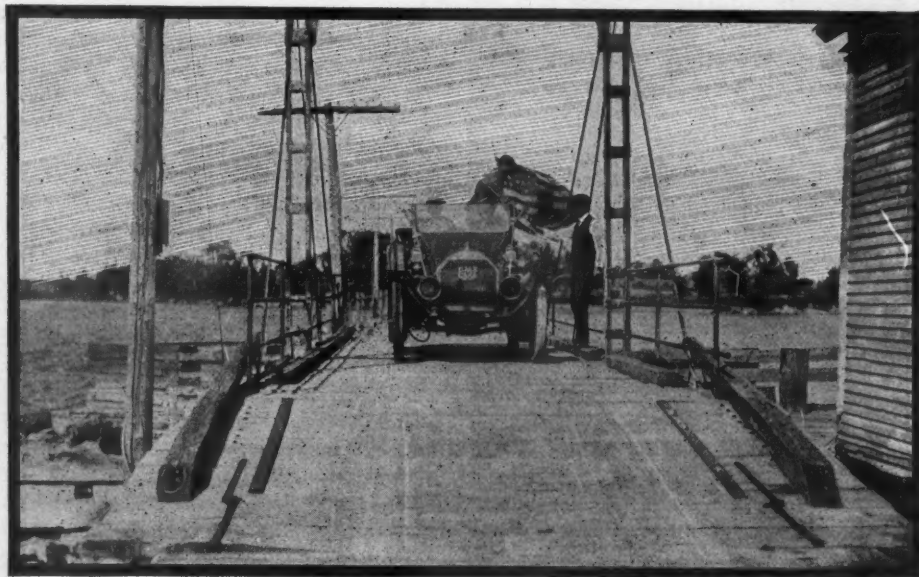
some very bad roads, we only had advanced 58 miles. Between Monteith and Panora we came near stalling on a muddy hill with our low-speed clutch in, but fortunately we were going down the hill and managed to get through.

The next day, our seventh of actual travel, we encountered the finest roads we had yet seen. Leaving Panora at 7 a. m. we soon were in famous Greene county, where the Glidden tourists found such restful driving a month before. From Jefferson we followed the Glidden trail to the north line of the state. Though it had been a month since it was thrown out, we found the old confetti at nearly every turn. We passed through Gowrie, Fort Dodge, Humboldt and Algona. Between Algona and Burt our drive-chain jumped off the sprockets, and it being dark, we accepted the offer of a local motorist who happened to pass to tow us the 3 miles to Burt.

The next morning we adjusted our chain and sprockets, and went about 14 miles when the chain again broke. This soon was repaired, but in another mile it broke again, this time winding the housing around the rear axle and pulling the brake supports in so the brakes would only partially hold. This injury could not be repaired on the road. We were between the towns of Bancroft and



HIGH ROCK AT WARRESBURG, N. Y.



MUNSEY TOUR PATHFINDERS AT TOLL GATE ON STONE BRIDGE OVER LAKE CHAMPLAIN

Germania, 635 miles from home and 135 miles from St. Paul. We engaged a farmer's son to pull us into Germania with his team, but after about a mile it was found that the brakes would not hold well enough to go down grades. I might say we found this out by trying it, and we are now trying to forget the details of that experience. Suffice it to say, no one was hurt and we sent to Germania for help. After getting the car back on the road, right side up, and hitched securely to the rear of a dray wagon, it was drawn to the station, where we shipped it to St. Paul, for which city we took the first

train. We were soon at White Bear lake, 16 miles northeast of St. Paul where we spent 2 very pleasant weeks.

On the return trip we followed the Glidden trail to Owatonna. From here we went to Austin, and from there south into Iowa. Some of the towns on our route through Iowa were St. Ansgar, Osage, Floyd, Charles City, Nashua, Waverly, Cedar Falls, Waterloo, La Porte City, Vinton, Cedar Rapids, Solon, Iowa City and Columbus Junction. We stopped at the last-named place a few days. We then shipped the car and took the train for home.

Blazing the Trail for Munsey Tour



E-M-F PATHFINDER IN MAINE WOODS



MUNSEY PATHFINDER NEAR BRETTON WOODS—MOUNT BARTLETT IN DISTANCE

WASHINGTON, D. C., July 11—The pathfinding trip of the Munsey historic tour was completed in Washington on July 6, the trail-blazing party being out exactly 3 weeks in laying out the route, in an E-M-F. The route will be approximately 1,650 miles and will pass through ten states and the District of Columbia. It will embrace a section of the country that has figured in all the valiant deeds that marked the beginning of the republic. The average day's run will be 137 miles, although on a number of days the contestants will be called upon to make from

167 to 199 miles. The shortest day's run will be from Binghamton to Wilkes-Barre, 85 miles, but the road conditions are such that this short journey is equal to any day's run in the itinerary. The last 3 days of the tour will be the hardest. Rough and rocky roads lie between Binghamton and Washington and it is between these two points that the real hardships of the tour will be encountered. The scenic features will compensate in a measure for the rough going on this stretch.

The pathfinding party in the E-M-F touring car, driven by Tom Skeggs, received a cordial welcome all along the line. They were recipients of numerous courtesies from clubs in many cities and were assured the contestants will be entertained royally when the tour reaches those cities. Among the clubs that are preparing to entertain the Munsey tourists are the Quaker City Motor Club of Philadelphia, Automobile Club of Waterbury, Bay State Automobile Association of Boston, Automobile Club of Vermont in Montpelier and Burlington, Binghamton Automobile Club and the Motor Club of Harrisburg.

The entry list now numbers twenty, of which seventeen are factory entries. The factory entries are a Premier, Columbia, Selden, two Washingtons, Reading, War-

ren-Detroit, Corbin, Spoerer, two Brush runabouts, Regal, Pierce-Racine, two Krits, Enger, and Great Western. A Ford has been nominated by the Ford dealer in Washington, a Maxwell by the Maxwell agent in Baltimore, and an Elmore by Frank Hardart, a private owner of Philadelphia.

NO AUGUST SPEEDWAY MEET

Indianapolis, Ind., July 11—There will be no meet at the speedway during August, the management having decided to abandon the 24-hour race which was to have

been run August 13-14, fearing accidents in a long grind like that which might mar the excellent record of the track for this season. Instead, Moross will bend all his efforts to making the September session a memorable one. With this idea in mind, it is contemplated to card a special race which will attract the foreigners who come over for the Vanderbilt and grand prix. This event is to be at 100 miles and the first prize will be \$2,000, the largest cash offering yet made by the speedway people. Besides this there will be run on Saturday, September 3, the speedway gold purse race, open to free-for-all cars of under 600 cubic inches piston displacement; distance 200 miles. Second prize will be \$500 and third \$300. Besides the usual short-distance events there will be run at this meet the Remy and Prest-O-Lite and the Schebler also may be contested.

MATHESON ASKS RECEIVER

Wilkes-Barre, Pa., July 8—Application for a receiver for the Matheson Motor Car Co., maker of the Matheson car, was made yesterday. Following this legal step the following statement was made by C. W. Matheson, president of the Matheson Automobile Co., the distributor of the product of the Matheson Motor Car Co.:

"The action of the Matheson Motor Car Co. in applying to the courts of Luzerne county, Pa., for a receivership is friendly, and, in reality, spells but a step in the direction of the expansion of the manufacturing company. The immediate cause for this step was brought about by the action of a few creditors who were pressing their claims to the detriment of the company. For the conservation of the interests of all the receivership was decided upon as a friendly protection.

"The indirect cause leading up to the action was the delay in the shipment of materials to the factory, the cold, wet spring weather and general slump in the stock market, which affected deliveries on dealers' contracts for several hundred cars. If the dealers had not been restrained because of these conditions in taking the cars contracted for the necessity for this action might not have arisen.

"The company is solvent, the assets exceeding the liabilities by \$262,748.20. The company is rapidly converting its materials into finished cars, and will continue to do so in order to execute the contracts now in hand, and in view of these facts it is expected that the receivership will be temporary only.

"The Matheson Automobile Co. is not in any way affected by the action of the Matheson Motor Car Co., the latter being merely the source of supply of Matheson cars, which are marketed by the company of which I am president. Plans are practically completed for a larger factory output than ever before, and the manufacturing company doubtless will emerge from this passing storm in sounder and more healthy condition."



DANGER SIGNAL ON RIVER-TO-RIVER ROAD

THE RIVER-TO-RIVER ROAD

CHICAGO—Editor Motor Age—I have noted with interest the enterprise shown by Motor Age recently in the good roads movement, and being a passenger on one of the cars in the recent Glidden tour, I am in a position to say something on the question of roads as encountered on the tour. Enough has been said on poor roads, so I will confine myself to what I consider one of the best examples of roads on the run.

Much has been said about the river-to-river road across Iowa and to all of the tourists this road from Council Bluffs to Des Moines was one of the agreeable surprises on the run. From Des Moines to Davenport it was not so good. This river road is 380 miles in length and extends from the Missouri river on the west of Iowa to the Mississippi river on the east. The road is an old road, having been in existence for years, but has received attention from the river-to-river road organization, which organization was formed to keep the roads in suitable care. This is a dirt road from start to finish and after rains the King drag is used to level the surface. So perfect is the organization over it that the entire 380 miles can be dragged in 3 hours' time. This phenomenal work is made possible only by the organization, which is similar to that employed on a railroad.

This river-to-river road is one example of what might be done in a score of states in the Union. What has been accomplished on this road counts for more than what could be accomplished at a dozen good roads conventions where the delegates listen to long talks on scientific road construction, expensive road maintenance, history of European highways, etc., etc. It seems to me that the originators of the river-to-river scheme have hit upon the one possible way of stimulating good roads movements, and that is by getting the farmers along the

The Readers'

road to work. It is work that counts in the end. A century of talking may not produce as much results as a week's labor. We can only hold the interests of people when we have those people act, and by act is meant to work such as the farmers along the river-to-river road do by dragging this road after a rain. It is a law of the human race that if you can only hold the interest of the people in proportion that you arouse their activities, and it will take years to arouse the activities by simply lecturing good roads and making the farmers receptacles into which this information is poured. Iowa has set an example to the entire country, first in the selection of a river-to-river highway across the state which will undoubtedly be selected by all tourists in the future; second by the method of organization for keeping this road in repair; and third by the erection of signboards along the route showing where turns are to be made and warning signs at railroad crossings, steep hills, and dangerous curves.

I see no reason why Illinois should not select a capital route from Chicago to Springfield. At present there is no recognized highway between the capital city of the state and the metropolis. There should be. It will be useless to select a route and then not interest the people along it in keeping it in repair. The motorists of Illinois should unite and select a national-state route, but once this is done they should formulate schemes for repairing it and sign-

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

boarding it, such as has been done by the river-to-river road association across Iowa. Several illustrations given herewith show the excellent condition of this road as well as the different types of signboards used. The road is not a straight path from Council Bluffs to Davenport, but rather a winding one with right angle turns and detours, etc. It has been selected, however, with the object of making it a representative cross state route.—Tourist.

TAXICAB LINE MIGHT PAY

Detroit, Mich.—Editor Motor Age—Will Motor Age in the Readers' Clearing House columns inform me to the best of its ability whether or not a taxicab line of five or six cabs in a town of 40,000 people would pay well. There are six railroads and one electric line, and about twelve carriages daily make from \$5 to \$8 each. In the evening they run about six carriages, making from \$4 to \$6 each. Can one taxicab do as much as three carriages? I would be glad to receive any additional information concerning this business that Motor Age can give.—A Weekly Purchaser.



RIVER-TO-RIVER ROAD HAS A BROAD WELL LEVELLED SURFACE
ROOM FOR THREE CARS ABREAST ON RIVER-TO-RIVER ROAD

Clearing House

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated

The taxicab line would pay if the hauls are not too long and the passenger traffic is heavy in proportion to the population. It would be wise to start first with a couple of taxicabs running and one in reserve. It is impossible to gauge with any degree of accuracy the possibilities of taxicabs in cities of the population given. The use of taxicabs depends on the dispositions of the people. If the people are disposed to use modern means of locomotion the outlook is good, otherwise they have to be taught the use of the taxicab.

BETTER THAN SHELLAC

Cornwall-on-the-Hudson, N. Y.—Editor Motor Age—With all the experiments up to the present, so far as I know, there have been but two methods used in making floats for carbureters—one hollow metal, and the other the use of cork coated with shellac. Permit me to suggest that there is a much better material than shellac for coating corks. I have tried it out with perfect satisfaction. It is open for any one to use. Ozokerite is dissolved by heat alone and is utterly impervious to any liquid so far known.—C. B. Hatfield.

Ozokerite, hatchettite, adipocerite, or mineral adipocere is a native hydrocarbon of the nature of paraffin. It is waxlike and melts at 115 Fahrenheit. The specific gravity of any natural mineral is about .61, but after melting this specific gravity rises to .92 or even higher.

QUEEN MOTOR HEATS

Pana, Ill.—Editor Motor Age—Will Motor Age or some of its readers tell me what to do for an overheating engine and water boiling in the radiator. I have a four-cylinder, 30-horsepower Queen touring car. The car started to heat last fall and now I find it impossible to run the car 1 mile without the water boiling. The water pump is working well, the exhaust pipe clear, lubrication good, and the fan is working well. I would be pleased to hear something through these columns, as we have exhausted all the local knowledge.—F. W. Howell.

Granting that what you say relative to the water pump exhaust pipe and lubrication being in good condition is true, it is most probable that your trouble is due either to mal-adjustment of the carbureter, late timing of the ignition, or incrustations in the radiator. Motor Age would suggest that you smell of the exhaust of your car while the motor is running. If the odor is pungent, which is a characteristic of a rich mixture, regulate the needle valve of the carbureter and perhaps the air valve a trifle so that a leaner mixture will be used. If the motor will not run properly when the



DIRECTION SIGN ON RIVER-TO-RIVER ROAD

gasoline in the mixture is cut down, it may be possible that there is an air leak in the intake pipe either where it is connected with the carbureter or to the cylinders. If the carbureter is found all right, test the ignition and see that the spark when fully retarded takes place in the cylinder before it has proceeded more than one-quarter inch downward on the explosion stroke. If the ignition, also, is found to be properly timed, it might be well to clean out the radiator. Almost any of the boiler compounds on the market, which are obtainable from any of the engineers' supply houses, may be conveniently used for cleaning scale or deposits of lime from a radiator. If you prefer to make your own compound dissolve 2 pounds of crystals of soda to each gallon of water contained in your cooling system. Put it in the radiator, run the motor for a few seconds so that the solution is well distributed throughout the system, let it stand over night, then flush out thoroughly in the morning with clear water. See that there is a free and unobstructed flow of water from the outlet of the radiator and test the flow of water through the entire system by disconnecting the hose which conducts the water from the cylinders to the radiator, and then while the motor is running and while one person is replenishing the supply in the radiator see if the water flows freely through the system. There are other reasons why motors heat, but it would be impossible to mention them all at this time.

P. & F. CURRENT CONSUMPTION

Chicago—Editor Motor Age—I am using a P. & F. spark timer on a four-cylinder Rutenber engine in a Stoddard-Dayton, and have a new Pittsfield coil, the vibrators of the coil, however, are fastened down. I have used this spark timer about 1 year, but it seems to use up the batteries too rapidly, a new 6-60 Vesta lasting only about 60 miles, and a Duro lasting about the same number of miles. It is claimed for this spark timer



LONG UNDULATIONS ON RIVER-TO-RIVER ROAD OUTSIDE OF COUNCIL BLUFFS
A DUST STUDY AT POINT SHOWN ABOVE ON RIVER-TO-RIVER ROAD

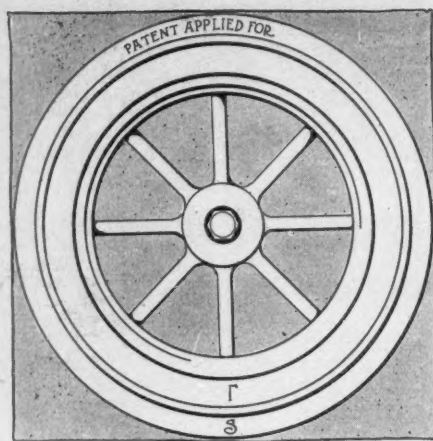


FIG. 1—BECKWAY'S TIRE PROTECTOR

that it will more than double the life of the batteries, but I have found it otherwise, and would like to have the opinion of Motor Age as to whether these timers do use up the batteries quicker than the four vibrators, if used on the coil. This spark timer makes the engine run better than it ever did, and I have had no trouble with the ignition since installing it, "never missed a shot" since it was used. The only trouble is that it runs the batteries dry too rapidly.—J. L. Falls.

There is a small lever arm under the brass plate to control the length of the back stroke of the armature, or, in other words, to control the time the spring is in contact. Shortening this back stroke decreases the current consumption. These spark timers are set for .3 ampere current consumption and should not vary 20 per cent on any adjustment. It may be that you have a leak in your battery cables. Look them over. It is possible that a hole has been worn through the insulation of the battery wires at some point where they rub against some metallic portion of the frame or engine; or perhaps they are badly water or oil soaked at some place. If your battery box is of metal it is possible that there is a short circuit there. The switch also might be guilty of a stray strand of the wire cable being unraveled and causing a small short circuit or leak. It is also plausible that the batteries you are using are in bad shape, the plates buckled or an accumulation of sediment at the bottom of them so that they are unable to hold a charge. They may be internally short-circuited.

RATIO OF SPEEDOMETER GEARS

Cicero, Ind.—Editor Motor Age—What is the proper size of large and small gears necessary for a Stewart speedometer in order to register a 30 by $3\frac{1}{2}$ tire accurately.—Harry Wickel.

The method used by the Stewart Speedometer Company in determining the relative sizes of the gears driving their instruments is as follows: The large gear should have as many teeth as twice the diameter of the vehicle wheel in inches, and the smaller gears always have sixteen teeth. Thus, on a 30-inch wheel the large gear would have sixty teeth, on a 32-inch wheel sixty-

four teeth, on a 34-inch wheel sixty-eight teeth, etc. The difference in the diameter of the tires has been taken into consideration in arriving at these figures, and the effect of different tire diameters on the calibration of the instrument is too small to be taken into consideration.

THREE-WHEEL DELIVERY CAR

Pelham, Ga.—Editor Motor Age—Where can I secure a motor tri-car; in other words, I want a small motor mounted on three wheels for delivery purposes.—A subscriber.

W. G. Wagenhals, a mechanical engineer of St. Louis, Mo., has designed and had built a motor delivery wagon that might meet your requirements. The car is designed to meet the rapidly growing demand for a light delivery motor vehicle that would not cost as much as a good horse and wagon. The motor is a two-cylinder, four-cycle, opposed water-cooled and of 14-horsepower, with a two-speed transmission and chain drive. It has but three wheels, two in front and one in the rear, driving through the single rear wheel. This is perhaps the only motor vehicle with a carrying capacity of 500 pounds, not using a differential. It is declared that this design offers all the advantages of a four-wheeler without the necessary complications, and is more cheaply maintained. Illustrations of this car were shown in Motor Age, issue April 28, 1910, pages 28 and 29. The majority of motor-cycle manufacturers build three-wheel attachments for light delivery work.

BUILDING MASTER VIBRATOR

Montezuma, Ia.—Editor Motor Age—Will Motor Age give me some information as to the kind, size and length of core, size and resistance in ohms of winding for use in the construction of a master vibrator coil.—W. E. McKee.

It is hardly possible that any two manufacturers use the same kind and size of wire, length and size of core, etc., as another, and as this is purely an engineering problem manufacturers are reluctant to give out information of this kind. On the other hand unless you had facilities for obtaining the proper materials at little or no cost and for properly treating and assembling them, it would be very impractical to make a coil for your own use.

PNEUMATIC TIRE PROTECTION

Chicago—Editor Motor Age—I am sending herewith a drawing and a description of a steel pneumatic tire wheel, which might prove of interest to readers of Motor Age. Instead of the pneumatic tire T, Fig. 1, bearing on the roadway, the felloe of the wheel bears on the pneumatic tire, the ordinary pneumatic tire has a small bearing surface on the roadway. This wheel has about three times the bearing on the pneumatic tire, therefore the air pressure in the tire only needs to be one-third

of the pressure now used, getting the same resiliency, and greatly lessening the danger from explosions. There being no part of the pneumatic tire touching the roadway, there can be no punctures and no wear to amount to anything, and the outer casing of the pneumatic tire would not necessarily have to be of rubber. It could be a strong woven material, greatly reducing the cost of tires. The larger the tire the easier riding machine one would have. This tire could be used on all of the large trucks. A 6-inch tire would carry a 10-ton truck, greatly reducing the wear and tear on the machinery. The steel tire would be put on and then the pneumatic tire would be inflated and it is ready for use.—George Beckway.

WHY THERMO-SYPHON WORKS

Milwaukee, Wis.—Editor Motor Age—I am a subscriber to Motor Age and wish you to kindly answer a question for me over which I and a friend had quite an argument. My friend says that in thermo-syphon cooling the cold water forces the water to circulate and I maintain that the heated water makes the circulation. Which is correct and why?—P. Klapinski.

In one sense of the word you are both wrong, and in another sense you are both right. It is really the force of gravity which causes the circulation of the water in the cooling system, but as warm water is lighter than cold water, when the two are mixed there is a tendency on the part of the warm water to rise and the cooler water to fall. As the water in the circulating system is heated in the waterjackets of the motor, it rises and passes through the piping to the radiator. Here it becomes cooled and as it cools it becomes heavier and descends. It is the weight of the heavier water in the radiator which forces that in the pipes leading to the cylinders up to the waterjackets and it is the lightness of the warm water which permits it to be driven through the waterjackets and flow back into the radiator.

HIGH-SPEED CLUTCH SLIPS

Tipton, Ia.—Editor Motor Age—Will Motor Age, through the Readers' Clearing House, tell me what is the best thing to do when the high-speed clutch on the model 10 Buick slips. I am going to take a trip from Tipton, Ia., to Luverne, Minn., and would like to go by way of Galva, Ia. Could Motor Age give me a route?—Edward Roehlk.

When the high-speed clutch of the Buick model 10 slips, the slipping is generally due to a burning out of the clutch facing, and the remedy is to remove the transmission, disassemble the clutch and have the clutch cone relined, or refaced.

As for a route to Luverne, Minn., by way of Galva, you might follow a route from Clarence to Dennison which is covered in detail by the Official Automobile Blue Book. By this route you would have to drive from





Tipton to Clarence and then pass on through Cedar Rapids, Belle Plaine, Tama, Marshalltown, Ames, Boone, Grand Junction, Jefferson and Dennison, then go north to Galva. From Galva you might follow a route which takes in Cherokee, Le Mars, Orange City, Sioux Center, Perkins, Rock Island and north to Laverne.

VALVE-TIMING CAUSES MISS

Anna, Ill.—Editor Motor Age—Will Motor Age give me some information on the following: A model 30 Stoddard-Dayton four-cylinder car misses fire when the engine is running loose, neutral position, but when on high speed and well under way does not miss at all. The magneto is driven by a friction wheel on the flywheel. A new cylinder has recently been put in the engine. By short circuiting I find the miss but have failed to remedy it. Heretofore the engine never acted in this manner at all.—R. E. Atkins.

To begin with, why is a friction-driven magneto used on this car unless the owner has selected it for some personal reason? This motor is made with a regular bed plate for fitting a standard type of gear-driven magneto. There are two leading reasons apparently for this mis-fire: First, the magneto is undoubtedly too far advanced when the motor is running idle. You will invariably get a miss with too early a spark under such conditions. Second, if the magneto is not at fault, the miss may be due to lack of proper timing on one of the valves, one of these being slightly off its seat on the compression stroke, with the result that the compression is lost and a miss results. Since you say you have discovered in which the miss occurs, it is easy to verify the timing. On the cylinder in which the miss occurs, bring the piston to the top dead center on the compression stroke. At this point the rocker arm should be entirely free. If not free, it may be holding the valve off its seating. This may occur on either the intake or exhaust valve for each cylinder. The timing of the valve can be rectified. The intake valve timing is corrected at the lower end of the push rod. The exhaust valve timing is corrected at the end of the rocker arm which bears on the valve stem. We should like to know if this is a solution to your difficulty.

CARBON REMOVERS

Richmond, Va.—Editor Motor Age—I notice that there are a number of preparations advertised to remove carbon. Are any of them safe? We know that they guarantee not to injure the working part of a car. Has Motor Age any record in its office, or information to verify these statements, and if so, which is the best and most reliable carbon remover?

2—Is there an outside or inside tire

cover that will absolutely protect tires from puncture and blowout? If so, are they practical?—XX.

1—It is not the scope of Motor Age in these columns to recommend any one carbon remover. Suffice it to state that Motor Age has tried out experimentally practically every carbon remover that has been listed and has in the majority of cases found them capable of removing carbon. Motor Age would solicit experiences from its readers for these columns relative to this matter.

2—There are several outside and inside tire covers which will prevent puncturing, but the majority of them have their disadvantages. The trouble with some inside protectors has been the generation of heat. There are metallic outside protectors which will prevent puncturing but they are too expensive and too heavy to be considered really serviceable. There are outer coverings which prevent puncturing to a very great extent and save tires on rough roads. These are readily attachable and are satisfactory.

POPE-HARTFORD SIZES

Salisbury, N. C.—Editor Motor Age—Will Motor Age give me the bore and stroke of the 1910 five-passenger Pope-Hartford car, also the same information relative the 1911 car?—W. H. Hennessee.

The bore and stroke of the 1910 Pope-Hartford cars are 4 5/16 and 5 1/8 inches, respectively, and of the 1911 cars 4 3/4 and 5 1/2 inches.

GET A NEW RIM

Detroit, Mich.—Will Motor Age kindly inform me what can be done to the rim of a Mitchell car that has been dented by running flat?—The Bartlett Co.

Your best solution is to get a new rim. The rim which is dented is scarcely 1/8 inch thick and it will be almost impossible to have it drop back into satisfactory conditions.

CHICAGOAN'S IDEAL CAR

Chicago—Editor Motor Age—Why won't some carmaker build the kind of car I want? In 3 years I have driven three makes of cars. I know what I want. I want it for country work—and the car that is best for country work is also best for city work. Here it is:

1—A friction-drive with shaft to rear axle. The man who denies the superiority of the principle of the friction-drive is not a mechanic. It is the simplest, smoothest, safest. Its practical application has been disputed. I have used the friction-drive and know. No one can argue with me about it. Life is too short. The chain-drive is a relic. It is also a nuisance.

2—An air-cooled engine. They say they are not practical. I know they are. Radi-

ators perpetually leak and run dry and freeze. My car stands in the farm implement shed. It is as cold inside as outside. In winter I must drain my radiator every time the car is put away or use a mixture. A certain per cent of alcohol keeps it from freezing at a certain temperature. When the mercury drops 10 degrees it requires a larger per cent. Therefore, all I need to do is to rig a thermometer with battery connection on an alarm clock in my bedroom and when the mercury drops 10 degrees, be waked up by the alarm, dress and go out and put in more mixture. Simple and convenient, is it not? And yet makers claim that they are presenting a practical car for farmers' use. It would not be practical if every farmer had a steam-heated garage, as the water in the radiator will freeze when the car stands in town for a few hours. Water-cooling is an unnecessary nuisance.

3—Thirty-six to 40-inch wheels with airless tires and oil shock absorbers. I made the rounds of Chicago parks last Sunday. I passed an almost unbroken procession of still life-repairing tire troubles. And yet they call the motor car a pleasure vehicle! Rats! the pneumatic tire is a nuisance.

4—A torpedo body because primarily it affords the greatest degree of protection, and incidentally it pleases my eye best. It would require parts from five different makes of cars to assemble the car I want. Where is the maker who will put together this practical, troubleless car, and win a fortune and the blessings of his now tormented fellowmen?—G. R. W.

NO MAGNETO FOR LIGHTS

Trenton, Tenn.—Editor Motor Age—Will Motor Age please tell me, through the Readers' Clearing House, if I can run a small dash light with my Remy magneto. I have a small light on my speedometer that I am running on four dry cells.—R. A. Dement.

You cannot use a Remy magneto for lighting purposes. In the first place all the current would be consumed by the light and the ignition would be affected. In the second place, if it were possible to use the current a governor would be necessary, so the scheme is impracticable.

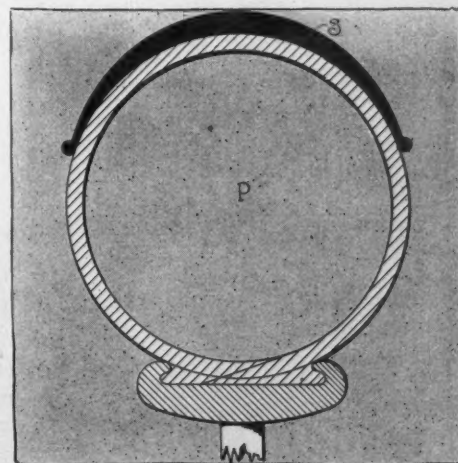


FIG. 2—SECTION OF TIRE PROTECTOR

VALVES AND VALVE SUBSTITUTES IN MOTORS

THE refinements which are called for in modern gasoline engines have necessitated very careful attention on the part of designers to the valves and their operating mechanism, as the performance of the engines with regard to development of power at high speeds, and also with regard to silence and smoothness of working, is largely influenced by the proportions and arrangement of these parts.

The subject has gained increased importance by the comparatively recent introduction of the sliding-sleeve valve, which was entirely novel in gasoline engine practice, and the performance of the engine in which it is embodied has led to the publication of a number of designs also using piston or slide valves. It would seem, therefore, that a useful purpose may be served by initiating a discussion on the various types, their comparative merits and the possibilities of some of the new designs.

The author proposes, in the first place, to discuss briefly the cycle of operations as it occurs in a modern high-speed gasoline engine.

Various arrangements of poppet valves will then be described and illustrated, and some points relating to cam forms commented upon, after which a few types of engines using sliding or rotary valves will be dealt with.

Sequence of Operations

The sequence of operations most common in gasoline engines is that known as the Otto cycle, in which the admission or charging stroke is followed by the compression, working and exhaust strokes in the order named.

Although it is mainly correct to say that one stroke is reserved for each of these operations, there is, in actual practice, a certain amount of overlapping. The necessity of this overlapping is clearly seen by following carefully through the cycle of a gasoline engine running at a high speed.

Commencing with the piston at the top of its stroke, prior to admission, we have in the combustion chamber a residue of exhaust gases at a pressure which is due to the resistance of the exhaust passages and the silencer.

The first outward movement of the pis-

Editor's Note—The following article on "Valves and Valve Gearing" was read by Alex. Craig, M. I. Mech. E., before the Institution of Mechanical Engineers of England.

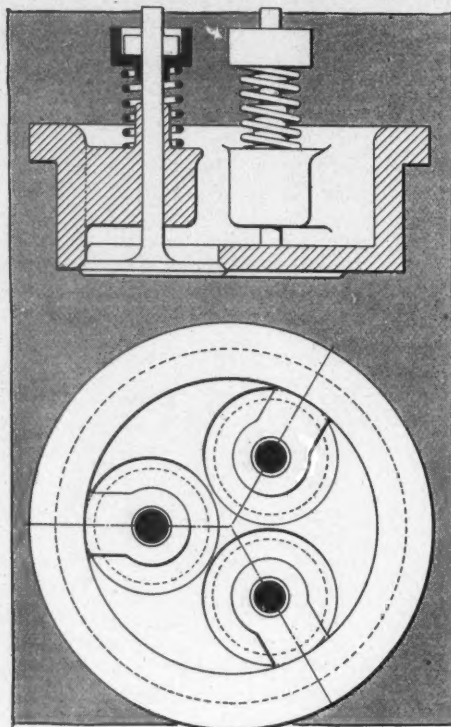


FIG. 1—NAPIER TRIPLE VALVE

ton causes the pressure to fall, by enlarging the space in which these gases are contained, and it is not until the piston has moved far enough to allow the pressure to fall below atmosphere that the new charge can enter the cylinder, whether the admission valve is open or not.

For the remaining portion of the outward stroke, with the admission valve open, the charge flows into the cylinder, owing to the excess of atmospheric pressure over the internal pressure.

When the piston reaches the end of its stroke, the pressure inside the cylinder is still below atmosphere, and if the valve be closed at this point, the cylinder would not be as fully charged as possible.

Volume Is Reduced

It is of course impracticable to arrest the piston at the end of its stroke, while the charging of the cylinder is completed, but in moving inwards on the next stroke the volume is reduced, and the internal pressure brought up to that of the atmosphere, when the piston has moved a certain distance inwards.

Up to the point at which atmospheric pressure is reached, the charge, owing to external atmospheric pressure and the momentum of the gas in the inlet pipe, would be capable of still making its way into the cylinder, if the valve were open, so that with the two influences at work atmospheric pressure would be reached at an earlier point, and this is the point at

which the valves should be properly closed.

Obviously, the speed of the engine has an important influence on the charging stroke, and with higher speeds the pressure at the end of that stroke would be lower, so that the time of closing the admission valve should be later for high speeds than for low speeds.

After the admission valve is closed, the valves cease to operate during the compression and working strokes, or rather, until near the end of the latter, when the exhaust valve commences its work.

Here, again, by reason of the limited time which is available for the expulsion of the exhaust, it is in practice found necessary to open the valve before the end of its stroke, although it would seem that a certain amount of energy must be wasted in so doing.

Back Pressure May Interfere

The exhaust valve remains open until the completion of the inward movement of the piston on the exhaust stroke, and the best time of closing is dependent on the design of the exhaust passages.

In the case of a four-cylinder engine, discharging into a common exhaust pipe close to the cylinders, there may be interference in the shape of back pressure from a neighboring cylinder which is just commencing its exhaust stroke, and this may warrant closing the exhaust valve at, or even slightly before, the top of the stroke; but where there is provision for the exhaust gases to leave the engine freely, it is better to close a little beyond the end of the exhaust stroke.

The rate at which the charge can flow into the cylinder is dependent on the excess of outside atmospheric pressure over the internal pressure, as well as upon the resistance of the carbureter, inlet pipe and valve passages.

Beyond a certain number of revolutions—dependent on the design of the engine—

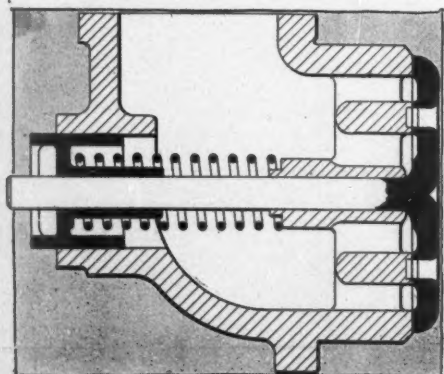


FIG. 2—NAPIER CONCENTRIC-SEATED VALVE

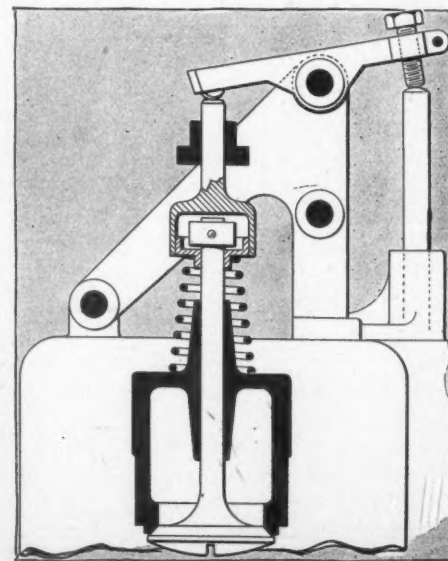


FIG. 3—COMBINATION VALVE-OPENER.

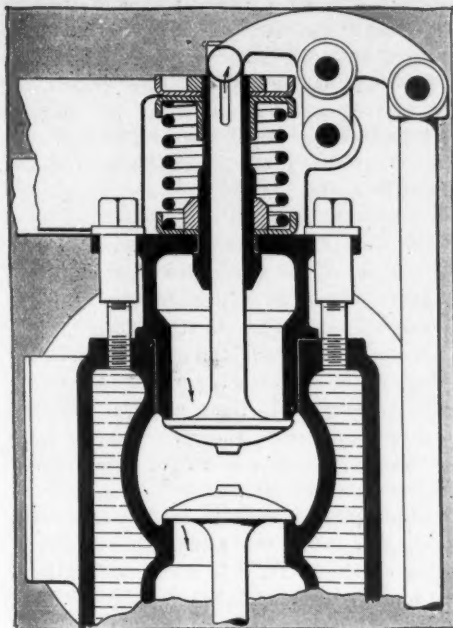


FIG. 4—MARTINEAU COMBINATION VALVE-OPENER

the weight of the charge taken in on each admission stroke must commence to fall with an attendant falling off of the compression pressure.

This probably explains why some engines which have been used in competitions run quite well at high speeds, with an abnormal compression ratio; while at low speeds they are very unsatisfactory.

It is conceivable that in such cases the actual compression pressure attained at extreme speeds is not greatly in excess of ordinary practice.

To make such an engine run satisfactorily at low speeds as well as high speeds, it would be necessary to have an efficient throttling arrangement for the charge, so that its weight might be kept within reasonable limits over all ranges of speed, even at the sacrifice of torque at the lower speeds.

Interchangeability Is Desired

It is common practice to secure interchangeability of inlet and exhaust valves by making them of the same proportions; but, obviously, if the maximum results are to be obtained from an engine, it is worth making the inlet valve as large as possible, even at the expense of the exhaust valve, since the expulsion of the exhaust gases is chiefly insured by actual displacement by the piston.

The position of the valves is a matter of some importance, as it affects not only their efficiency as valves, but also largely determines the form of combustion chamber.

A few years ago the most common arrangement, particularly in multi-cylinder engines, was to have the valves symmetrically disposed in pockets on each side of the engine.

This design lends itself to a convenient arrangement of exhaust and inlet piping. It necessitates a form of combustion chamber that offers a rather large area of cool-

ing surface in proportion to its capacity, and also entails the provision of two camshafts, with the necessary gear wheels to operate them.

At the present time the design in which the two valves are placed side by side in a single pocket over the same camshaft finds more favor. Many excellent engines are built of both types.

A type which necessitates only a single pocket has the inlet valve directly over the exhaust valve. When automatic valves were used this type was very common, but when mechanically operated, by a rocking lever and long rod, it is difficult to obtain the same degree of quietness as is possible in the types previously described.

One Spring for Both Valves

A compound inlet and exhaust valve is used in the Parsons engine. In this case the inner valve is used for exhaust and the outer shell valve for admission.

A single spring controls both valves, and a piston ring is fitted on the lower portion of the inlet valve to guard against leakage between the exhaust and inlet passages.

In the case of the Gnome aeronautical engine, where the crankcase and cylinders revolve around a fixed crank, the charge is led into the center of the crankchamber, and the inlet valves are fitted into the pistons. Provision has, of course, to be made to balance them against centrifugal force.

The increase in size of valves, to admit of high engine speeds, and the simultaneous reduction in the clearance volume to raise the compression, has given rise to some difficulty in the design of engines where the two valves are placed in the same pocket.

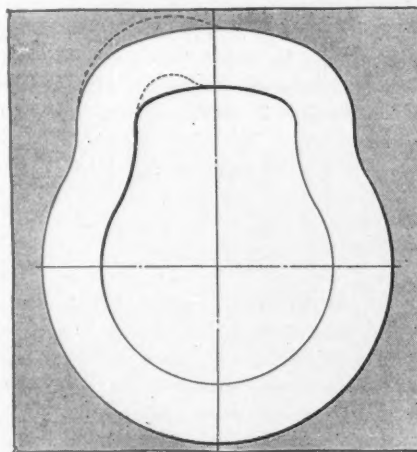


FIG. 6—CAM FOR 2,000 R. P. M. MOTOR

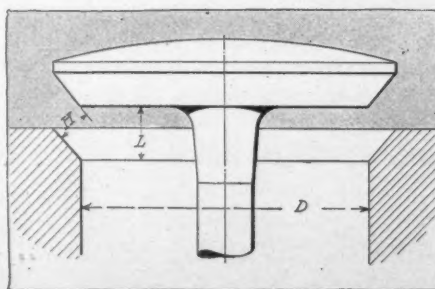


FIG. 7—BEVELED VALVE-SEATING DESIGN

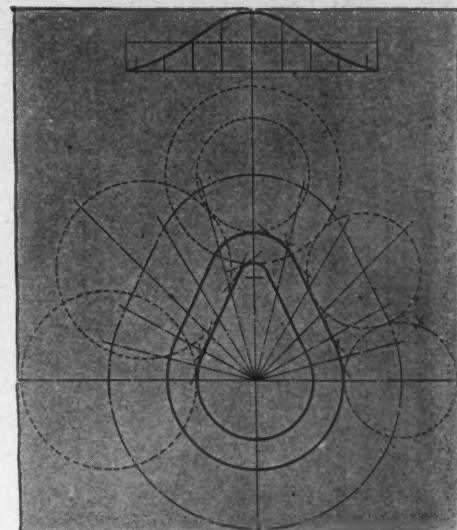


FIG. 5—CAM DESIGN AND CONSTRUCTION

The increase in the dimensions of the pocket to accommodate the valves has been provided at the expense of the clearance volume in the cylinder itself, so that the piston has to travel very near to the crown of the cylinder at the top of its stroke, and the passage between the valve pocket and the cylinder is in some cases restricted to an extent that impedes the flow of the gases. Moreover, the resulting form of combustion chamber is not good.

In the case of valves placed on opposite sides of the engine, the utility of half the circumference of the valve is affected by the proximity of the walls of the combustion chamber, against which the gases bank and prevent a free flow all round the valve.

An experiment made by a member of this institution throws some light on this point: In an engine of the type mentioned, the ordinary cap over the exhaust valve was replaced by one of special form, having a lip extending half way round the circumference of the valve, and just clearing it, to admit of the valve being freely operated. It had the effect of preventing the passage of gas past the valve for half of its circumference, but the brake tests of the engine showed very slight difference when the ordinary cap was replaced by the special one. Similar conditions obtain, in a lesser degree, in cases where two valves are in the same pocket, but here a less amount of the circumference of the valve is masked.

Smaller Valves May Be Used

With valves opening directly into the head of the cylinder, such restrictions do not exist, and it is found, in practice, that smaller valves may be used. Automatic inlet valves had practically fallen into disuse, except in some small air-cooled engines, but they have recently been employed in a few cases in engines for aeronautical work. It may be useful, therefore, to consider them briefly.

By the use of a very light valve and a

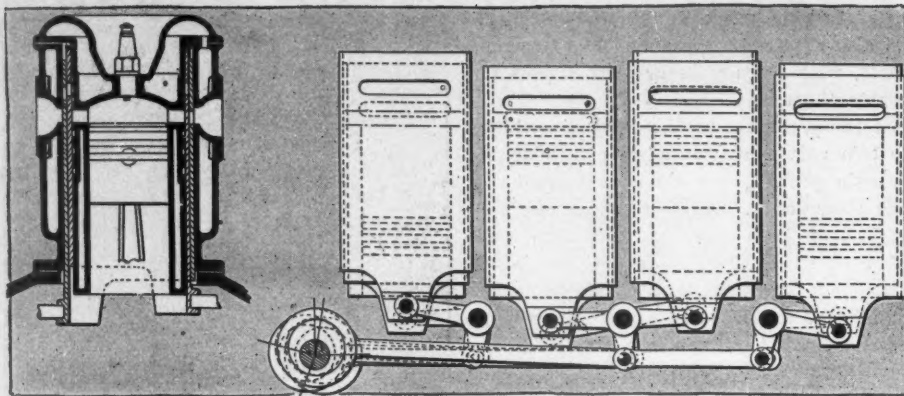


FIG. 8—RILEY SLIDE-VALVE MOTOR, OUTSIDE SLEEVES

delicate spring, with arrangement to limit the lift, the automatic inlet valve can be relied upon to open at the proper time, namely, directly the pressure inside the cylinder falls below that of the atmosphere. It will open rapidly, but close somewhat sluggishly, and has a tendency to flutter. The difficulty of providing sufficient area of opening with the plain valve, owing to the limited lift, was dealt with by the Napier company by the introduction of a neat form of triple valve, illustrated in Fig. 1. The same firm has used a mechanically-operated valve, having three concentric seats, as illustrated in Fig. 2. This type of valve was also used by the Mercedes company.

Some designers have endeavored to embody the feature of automatic opening in the mechanically-operated valve by causing the tappet lever to engage first upon the spring washer, which is free to slide a short distance on the stem, thus relieving the valve from the control of the spring and permitting it to open freely under atmospheric pressure. A further movement of the tappet lever forcibly opens the valve to its proper limit. Examples of this type are found in the Phillips valve, Fig 3, and the Martineau valve, Fig. 4.

The operating mechanism in the case of

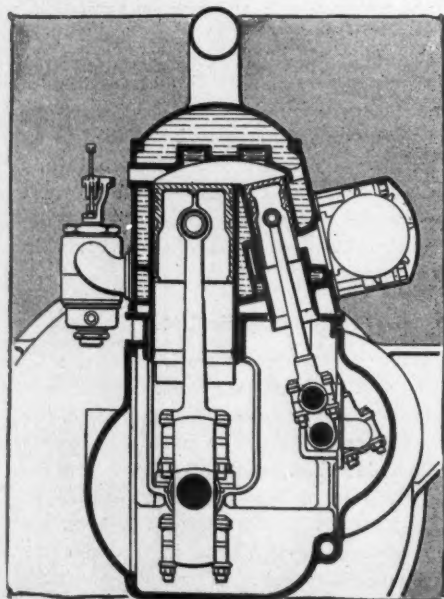


FIG. 9—HEWITT PISTON-VALVE MOTOR

the poppet valve usually consists of a cam engaging with a roller or rubbing piece on a lever or sliding block, which in its turn moves the valve stem. In many cases some form of adjustment is provided between the slide block and the valve stem. The design of this mechanism is exceedingly important, both from point of view of silence and power. Probably the first of these considerations is most important to manufacturers at the present time, and care is generally taken to keep the weight of the moving parts down to a minimum. The same attention, however, has not in all cases been given to the profile of the cam, and this is a question of some difficulty, as the form which is best for maximum power does not usually make for quiet running.

Before silence became so important, it was usual to design for a sharp opening, long period of full opening and quick closing of the valve, but to secure quiet running both rise and fall must be easier.

By reference to Fig. 5 it will be seen that the diameter of the roller as well as the cam must be taken into consideration. In that illustration the same diagram of valve movement is obtained from two cams of different size, in which the sum of the diameters of the base circle of the cam, and of the roller engaging with it, is the same in each case. The two cams would be equally smooth in action.

In a cam with an abrupt rise, the velocity of the moving parts may become so great that they will leave the cam at a point where the lift becomes easier owing to the momentum, and return into contact with it at another point, the roller center describing a path which can be calculated by the theory of oscillation of a loaded spring.

If the cam has a broad nose on which the roller dwells with the valve at its full opening, and the change to the falling side of the cam is too abrupt, the same thing takes place.

Strong Springs Are Needed

In many cases where the old type of quick-lift cams are retained, very strong springs are used to overcome these defects, but their use may introduce other difficulties, which defeat the object aimed at.

Fig. 6 shows a cam for which the roller path has been calculated for the cam revolving at a speed corresponding to 2,000 revolutions of the engine. The weight of the moving parts is taken as 12 ounces, and the spring exerted to a force of 30 pounds with the valve closed, varying at the rate of 60 pounds per inch of movement.

The dotted lines show the amount by which the roller leaves the cam, and to maintain contact it will be necessary to increase the strength of the spring, or, alternately, to extend the nose of the cam.

This latter course is the means by which, with comparatively light springs, contact may be maintained, though it may entail increasing the movement of the valve beyond its useful lift.

In designing a cam to work quietly at high speed, with the comparatively light spring on the valve, it is worth calculating and plotting the oscillation diagram of the spring, taking the extreme height as something greater than the lift necessary to give full opening of the valve. This curve should be plotted to a straight-line base.

The form of the cam at the beginning of its rise can be made to give a gradually increased velocity to the moving parts, and also plotted to a straight line base representing time and height to the same scale as the oscillation diagram.

Form of the Cam

A portion of each of the curves may be used to make up the rising and falling side of the cam, and if the spring taken has not been too light, there will be a circular path in the contour representing the dwell at full lift.

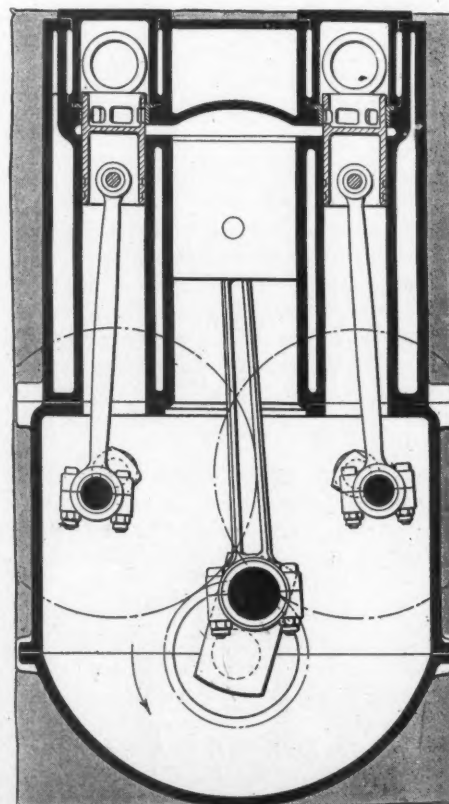


FIG. 10—DESIGN FOR PISTON VALVES

The clearance between the valve tappet and stem has not been referred to, but in ordinary practice this may be cut down to .008 inch, unless the valve stem is unusually long.

It is usual to calculate the area of opening of a poppet valve by multiplying its lift by its circumference. This is not strictly accurate in cases where the conical seating is used.

Referring to Fig. 7, in which the angle of the seating is 45 degrees, it will be seen that the distance, H , between the valve and its seating is less than the lift, L —in

$$\text{fact } H = \frac{L}{N^2}$$

The area of opening is equal to that of the curved surface of a truncated cone, the diameter of whose ends are D plus L and D , respectively, and whose slant height is

$$\text{equal to } H \text{ or } \frac{L}{N^2}$$

This area is less than πDL , which is the area of opening of a flat-seated valve.

In cases where large valves with small lift are used with conical seats, this point should be taken into consideration in calculating the area of opening.

Adoption of Eccentrics

By far the most important development in valve design since the introduction of the gasoline engine has been the use of sliding sleeves in lieu of poppet valves in the Knight engine.

By the adoption of eccentrics, or cranks, the cam problem has been eliminated, and the whole of the motions reduced to the simplicity of operation which is found in steam practice. The large number of these engines which are now on the road, in the hands of private people, together with the most remarkable performance under official observation, gives ample proof of the practicability of the design.

Probably the contact of the portions of the sleeves which are most affected by the heat of the gases during the exhaust stroke, with the water-cooled parts of the cylinder and head, during the other strokes, ensures the rapid dispersal of this local heat, which might otherwise cause trouble, and this is, no doubt, one of the most important features in the design.

The cylinder head, which might be described as a stationary water-cooled piston, is provided with rings, the lower one of which is broader in relation to the aperture in the sleeves.

The problem of providing for the movement of a piston valve, fitted with rings over the open ports in a cylinder, is inverted here, but the conditions are practically the same, and this point must have occasioned the designer some anxiety in the first instance.

It shows that a spring ring in a piston, if made sufficiently broad in relation to the port aperture in the cylinder, will pass freely over it, if the fits are good, and that bridges in the port, to facilitate

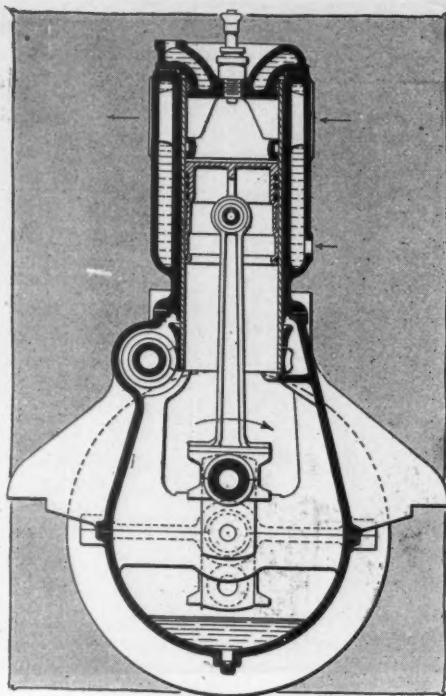


FIG. 11—REVOLVING LINER

its passage, are not really necessary.

The large surfaces of contact between the sleeves themselves, and also between the outer one and the cylinder wall, facilitate the passage of heat from the piston to the water jacket.

Good Form of Combustion Chamber

The arrangement permits of a very good form of combustion chamber, and a large valve opening is provided with comparatively small movement of the sleeves.

The advent of the Knight engine has directed general attention to the possibilities of piston valves, and a number of designs have been published, some of which may attain commercial success.

The nearest approach to the Knight engine is one designed by Percy Riley, in

which the sleeves are outside instead of inside the cylinder. This engine is illustrated in Fig. 8, from which it will be seen that the piston is in direct contact with the water-cooled cylinder, and that each of the sleeves has one of its surfaces in contact with the water-cooled parts of the casting.

For the same port area the sleeves need not be cut away quite so much as those of the Knight engine, and on the whole they would appear to be subjected to less severe working conditions.

The form of combustion chamber is quite good, and altogether the design seems quite a practicable one.

By the use of a transverse half-time shaft and bell cranks, with suitable connecting rods, only four cranks or eccentrics are required, as against eight in the Knight engine.

Fig. 9 illustrates the Hewitt engine, in which the piston valves outside the cylinder are operated from a half-time crankshaft. The small cylinders in which the piston valves work are thoroughly water-jacketed, and during the working stroke the small piston controlling the exhaust travels downwards, assisting the rotation of the half-time crankshaft.

Fig. 10 shows diagrammatically an engine in which piston valves are arranged on opposite sides and pass right through the pocket of the combustion chamber. The inlet and exhaust passages are above the valves, which are in equilibrium as far as pressure inside the combustion chamber is concerned. Connecting rods from half-time crankshafts in the crankchamber operate the piston valves directly, and provision against leakage is made by ordinary piston rings in the lower portion of the valve, but the upper ring, through which the perforated part of the piston valve passes, would appear to be an uncertain feature in the design.

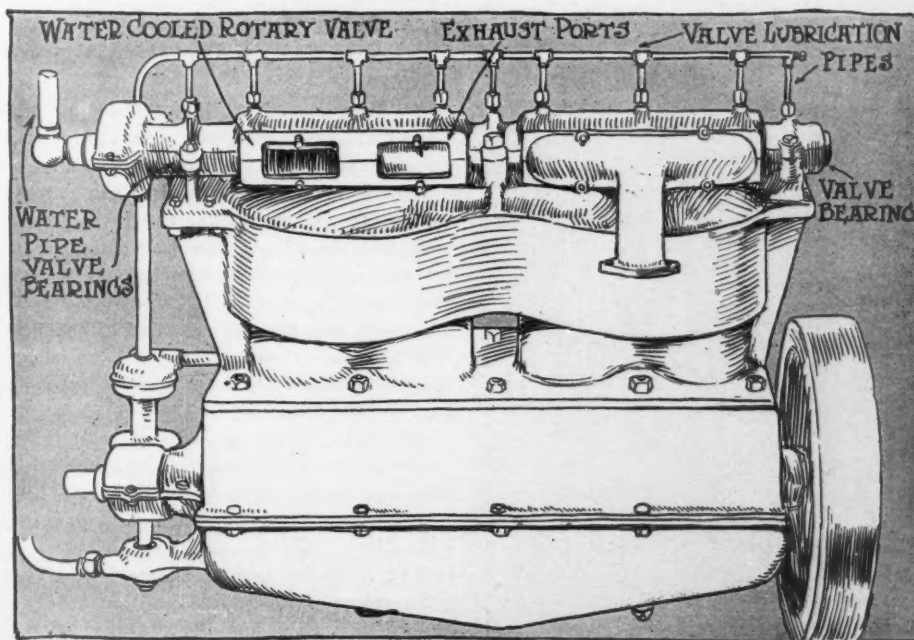


FIG. 12—THE LEWIS ROTARY-VALVE GASOLINE MOTOR

Numerous other arrangements of piston valves have been suggested, bearing more or less resemblance to those referred to.

In addition to the piston valve, the rotary valve has received a good deal of attention of late.

Its prior use on heavy gas and oil engines had not been entirely attended with success, although under some conditions it proved fairly efficient.

The boldest scheme that has been put forward, Fig. 11, includes the provision of a revolving liner between the piston and the cylinder walls. This liner extends downwards into the crankchamber, its lower end being cut in the form of a worm wheel, which engages with a worm on a shaft parallel to the crankshaft.

The water-cooled cylinder cover projects some distance into the revolving liner, and its lower side takes the form of a hollow cone, which is pierced by gas passages opposite the ports through the main water-jacket. When the aperture of the revolving liner comes opposite these ports, the gases have a free flow, and the timing of the engine is simply determined by the relative angular position of the two ports.

With a single aperture in the revolving sleeve it would be necessary to rotate the latter at half engine speed, but, subject to the limitations of port area, two, or possibly three, apertures can be arranged, reducing the revolutions of the liner to one-quarter or one-sixth of the engine speed.

A modification of this design shows the rotating liner carried through and operated from above, leaving the piston to run in direct contact with the walls of the water-cooled cylinder, but the difficulty of providing against leakage of the gases tells against this variation of the design.

Fig. 12 illustrates a rotary valve engine designed by E. W. Lewis, and in this case the valve is led along the top of the cylinders, and is cooled by water passing through its entire length.



FIG. 2—DELPEUCH AIR SUSPENSION—DETAILS OF CYLINDRICAL BUFFER

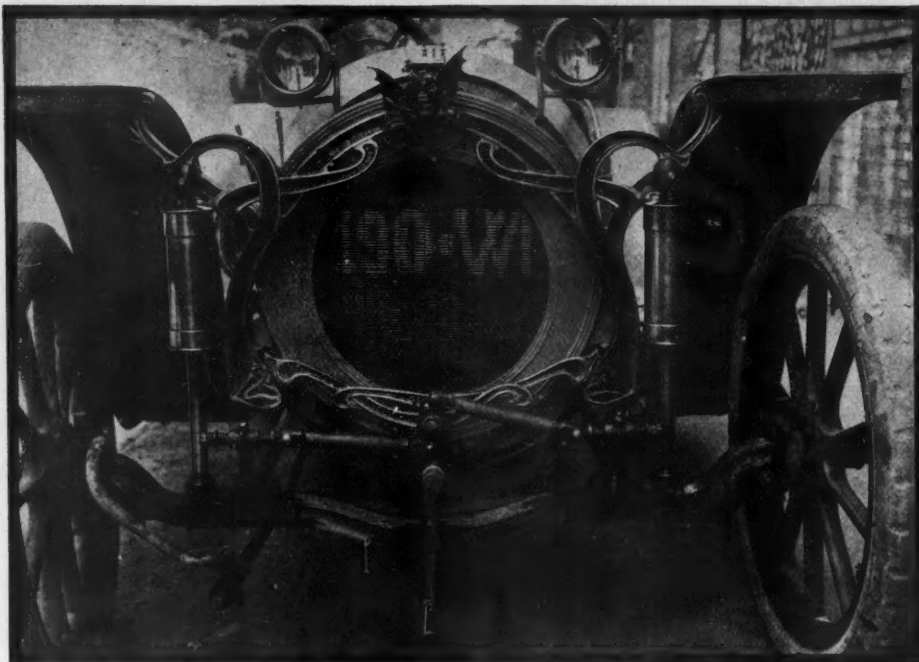


FIG. 1—DELPEUCH AIR SUSPENSION FITTED TO RUNABOUT

French Engineer Finds Air-Buffers

The case in which the valve rotates is split horizontally, the lower half being cast with the cylinders.

A most interesting feature of the engine is the provision for maintaining a gas-tight joint between the rotating valve and its seating on the top of the cylinder. The cylinders themselves are not directly attached to the crank chamber, but are inserted from above into an aluminum water-jacket, bored to receive them.

The joints are made by rubber washers, and the bearings of the rotary valve are carried, not from the cylinders, but from the aluminum water-jacket. The pressure inside the cylinders therefore keeps the latter up to the rotating valve, and the rubber washers are sufficient to allow for the slight movement necessary to maintain the contact between the seating and the valve.

An experimental engine of this type has been built and subjected to a considerable amount of testing.

Rotary valves do not entail the use of either cams or eccentrics for their operation, but the timing is simply determined by the spacing of the ports over which they move, and with their simplicity of operation and timing, provided difficulties which attended their use in earlier engines can be surmounted, they would appear to possess important advantages over other forms of slide valves.

The poppet-valve engine is now on its trial against the slide-valve type. It has had a longer time in which to prove its reliability, and, in the opinion of the author, if all the manufacturers devote the same attention to silence and smoothness of working that has been given to its newer rival, it will retain the confidence of the users of motor vehicles.

BY the use of air buffers Engineer Delpeuch, a Frenchman, has found it possible to abolish the use of all springs as well as pneumatic tires for motor vehicles of any size or weight. Briefly, his system consists of four cylindrical air-buffers in place of the four springs. The usual way of converting an ordinary car is as follows for the front suspension. The semi-elliptic springs are entirely dismantled and the frame members are sawed off about 1 inch ahead of the front of the radiator. To this projecting end is attached a wrought iron vertical member—the upper curved end of which receives the head of the cylindrical air-buffer. In order that the harmonious lines of the car may be observed the frame to carry the cylinders is a scroll work, generally with one arm made to support the front end of the mudguards. The connecting rod of each piston is bolted to the axle in practically the same way as springs are attached. In the illustration Fig. 1 the Delpeuch suspension is mounted to a racing runabout.

Two small tanks, carried within the frame, contain compressed air for the suspension, one tank feeding the two front buffers and the other the rear ones. The air is put under pressure through a dashboard connection either by means of a tire pump or a mechanical tire inflator. On the dashboard Fig. 4 also are two manometers indicating the pressure in the forward and the rear pair of cylinders, and provided with cocks for passing the pressure from one set of buffers to the other, as desired. Thus, it is possible to increase the pressure





FIG. 3—DELPEUCH AIR SUSPENSION FITTED TO REAR OF CAR

A Good Substitute for Springs

at the rear and decrease it at the front or vice-versa.

The cylindrical buffers Fig. 2 are each fitted with special pistons capable of holding compression equal to that usually maintained in pneumatic tires. This is obtained by a piston without compression rings, the nature of the metal being a secret of the inventor and covered by a patent. A charge of lubricating oil is placed in the cylinder when fitted, and this is generally sufficient for the normal life of the piston. As a proof of the entire absence of leakage a set of buffers fitted to a car were inflated to the normal working pressure of 5 kilogrammes and left untouched for 4 months; at the end of this time the loss from all causes was less than half a kilogramme.

Suitable piping, a part of it being flexible rubber tubing, unites each buffer to the compressed air tanks. In the head of the cylinder is an ordinary type of automatic valve which opens in the direction of the tank on the rise of the piston due to a road shock. Immediately on the pressure being released the valve closes and air begins to pass through a hole in the center of the valve until the pressure in the buffer has been re-established. In practice, over a rough road, the valve is continually being opened by the repeated road shocks, and just as frequently air is flowing back from the tank to the buffer.

The system has been found so satisfactory that it is possible to do without both springs and pneumatics. The car shown in the illustration is temporarily



fitted with pneumatic tires because no satisfactory solid tire was immediately available. It is found that best results are obtained with a tread of 2-inches for a medium-sized car, the rear tires being fitted with diagonal grooves as a preventative of side slip. It also is necessary that the metal rim shall be of such a nature as not to come in contact with the rough ground surface. This type of rim and tire is now being made specially for the suspension. As a practical test, two cars were presented, one with the Delpeuch air suspension and the other with ordinary springs and pneumatic tires. Experienced motorists were taken for a night ride in both over some of the worse pavé around Paris, without knowing in which car they were seated. In no case was it found that the air suspension was the less advantageous.

A strong point of the system is that it is possible to vary the pressure according to the load to be carried, or to decrease or increase pressure at front and rear as is desired. In fitting the apparatus it is usual to start on a run over bad roads with a rather high pressure and diminish it until the most easy riding is obtained. The operation occupies not more than 5 minutes. The inventor claims that this is a decided advantage for commercial vehicle work. Under a full load a high pressure can be maintained; when running home light the pressure can be diminished in a few seconds merely by the operation of the dashboard cocks. All possibility of leaks has been abolished. The compressed air tank, which is usually maintained at a pressure of 10 kilos, is tested to a pressure of 26 kilos per square centimeter. The usual working pressure for the buffers is 5 kilos per

square centimeter. The connection of the flexible tubing is by means of a very ingenious brass cone, onto which the end of the tubing is slipped and maintained by a screwed-on cone collar. This cone connection, which is capable of a very wide application, is the subject of a separate patent. It is claimed that the pistons will hold compression tightly and do their work without any attention or without any more oiling than the first charge, for 1 year's hard work. The cost of changing them is very reasonable.

To give the necessary lateral stability a couple of transverse rods working against a friction disk on the center of the chassis, has been fitted. This is clearly shown in the illustration Fig. 1, the central point of contact in this case being at the base of the radiator. Frequently the tube receiving the starting crank forms a suitable place of contact. The brackets on the axle which receive the pivoting transverse bars also receive the forward end of what may be called torsion rods running parallel with the chassis and attached to it at a point two feet to the rear of the axle by means of a ball and socket joint. The method of fitting to the rear axle is practically the same as for the front.

INDIANAPOLIS VALUATIONS

Indianapolis, Ind., July 11—The Marion county board of review is in session in Indianapolis, Ind., fixing the valuations of corporations of that city for tax assessment purposes. In practically all instances the figures given in the tax returns by the corporations are being accepted this year. Valuations fixed so far have been as follows: Airless Tire Co., \$6,000; American Motor Car Co., \$40,000; Cole Motor Car Co., \$50,000; Commercial Car Co., \$3,300; Conduitt Automobile Co., \$9,000; Co-Auto Motor Co., \$7,140; Direct Drive Mfg. Co., \$600; Empire Motor Car Co., \$45,000, and Hearsey-Willis Co., \$19,000.



FIG. 4—DASH PRESSURE INDICATORS OF DELPEUCH AIR SUSPENSION



Motor Car Development

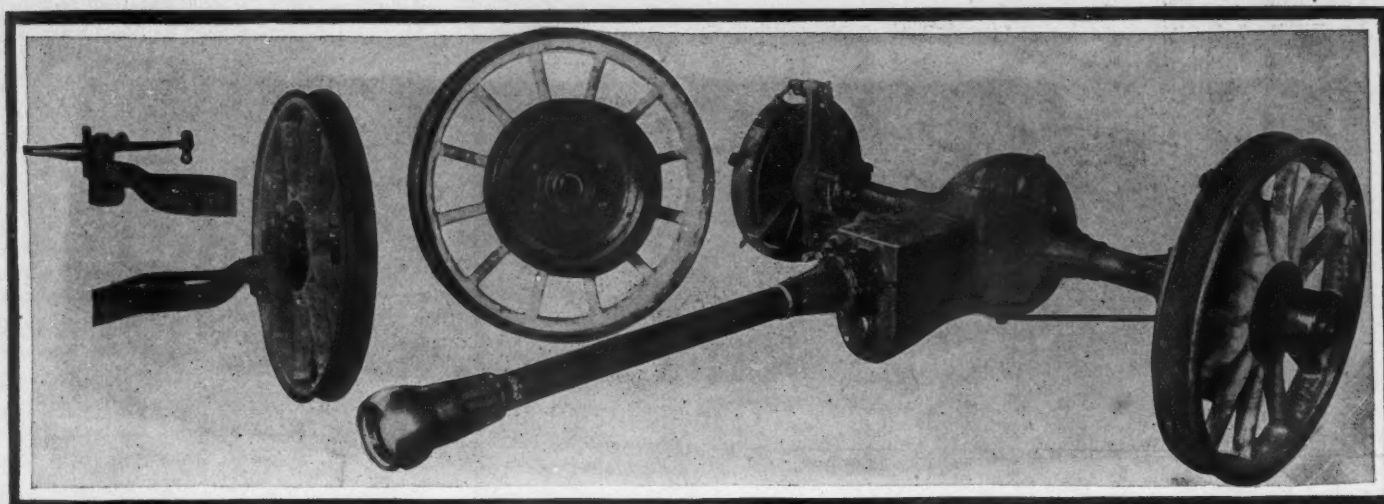
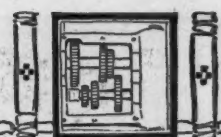


FIG. 1—SHOWING FEATURES OF DERAIN FRONT AND REAR AXLE CONSTRUCTION, WITH GEARSET AND REAR AXLE COMBINED

A NEW type of two-cycle motor car is now being placed upon the market by the Derain Motor Co., of Cleveland, O. It is made in two chassis types for runabouts and touring cars, and in several styles of body work; and although simplicity seems to be the keynote of its construction it is by no means conventional in design. The motor is of the four-cylinder two-cycle two-port type, with rotary inlet valves, a circulating lubricating system, and double ignition; the clutch is an expanding-shoe design attached to the flywheel; a propellershaft enclosed in a torsion tube and with one universal joint at its forward end, transmits power from the motor and clutch to the selective sliding gearset which is in unit with the rear-axle; the rear-axle is a floating design, an I-beam front axle is employed, wheels are 36 inches in diameter with 4-inch tires in front and 5-inch tires in the rear, and the standard wheelbase is 125½ inches for touring cars and 118 inches for runabouts. A specially long chassis also is offered by the Derain company, which has a wheelbase which measures 132½ inches.

Two views of the motor are shown in Figs. 2 and 3. It has four cylinders with a bore and stroke of 5 and 5½ inches respectively. The cylinders are cast in pairs with integral waterjackets and exhaust chambers; and the waterjackets, which are very capacious, have large openings at the top to facilitate coring and cleaning. These openings are covered with aluminum cover plates with a simple means of attachment. Great care is taken in preparing the cylinders and in machining them up. They first are rough-bored, then annealed, then given a final finishing bore and ground to size. The crankcase construction is novel in view of the fact that the crankpits for each of the four cylinders must be kept

The Derain Two-Cycle Car

separate and airtight for the purpose of pre-compressing the charges of gas. It is of the one-piece or barrel type, of cast aluminum and has cast integral with it but entirely shut off from the crankpits an oil reservoir of 3 gallons capacity, which is more than ample for oiling purposes.

The cylindrical seats for the five crankshaft bearing plates are all bored at one time so that perfect alignment is obtained; and large inspection plates P, Fig. 2, are provided for the inspection or adjustment of the connecting rods. The exhaust valves

of this engine are comprised of ports in the cylinder walls which are uncovered by the pistons as they near the end of the explosion or down stroke; being a two-cycle motor, every down stroke is an explosion stroke. These ports open into large exhaust chambers C, Fig. 2, to which an exhaust pipe of unusually large diameter is bolted. The four inlet valves are cylindrical in form and rotate in a cast-iron valve chest S, Fig. 3, bolted onto the upper right side of the crankcase. In operation, at every up-stroke of a piston, a charge is drawn from the carburetor C, through the intake pipe I, the valve chest S, and the valve opening, into the respect-

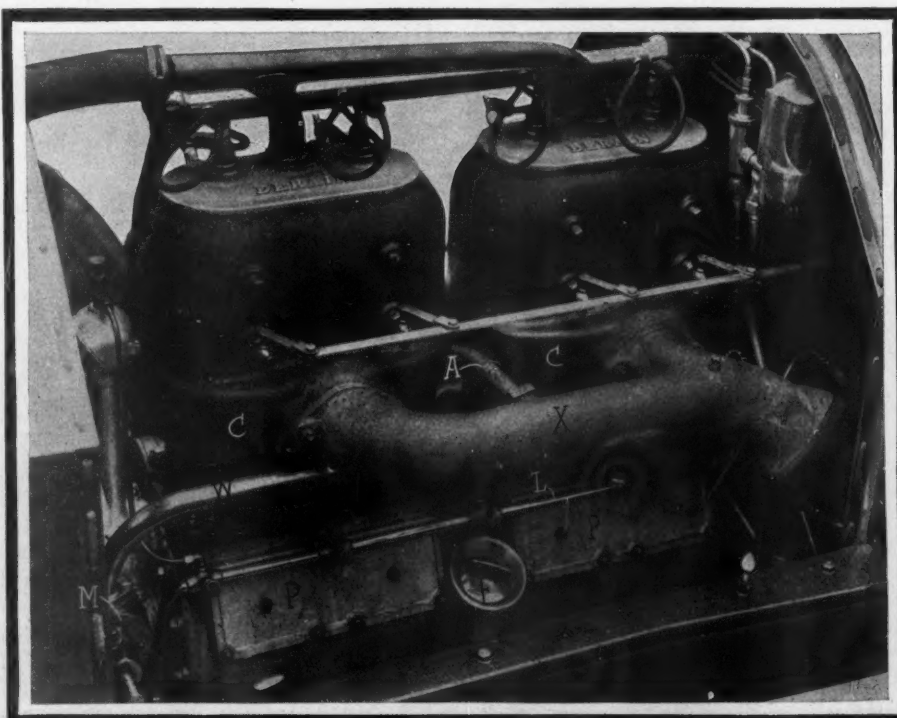


FIG. 2—LEFT SIDE VIEW OF DERAIN TWO-CYCLE MOTOR

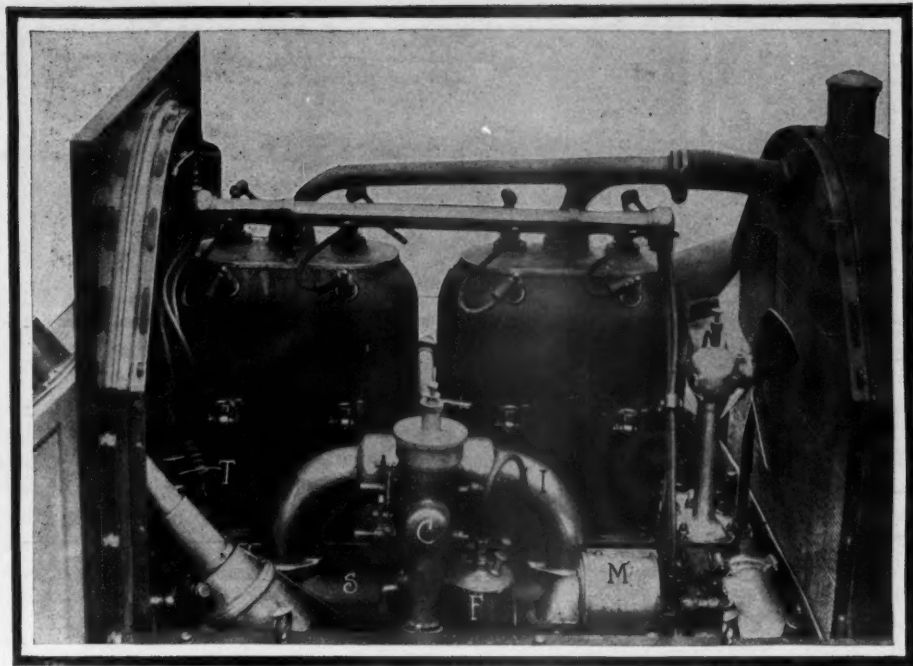


FIG. 3—RIGHT SIDE VIEW OF DERAIN TWO-CYCLE MOTOR

ive compression and crank compartment, while at the same time the charge in the cylinder above the piston is being compressed. As the piston passes over the top center the charge compressed in the cylinder is ignited and forces the piston downward, giving a power impulse to the crankshaft and also compressing the charge beneath the piston. As the piston nears the bottom center the exhaust port is uncovered and the burnt gases are allowed to escape; and as it reaches the end of the stroke similar inlet ports are uncovered, allowing the fresh charge which is compressed in the crank-chamber to flow through the rotary valve and a channel or bi-pass cast integral with the cylinder, into the cylinder proper. The pistons of this motor are $7\frac{1}{2}$ inches long, and each carries five compression rings—three of which are located at the top and two at the bottom of each piston.

The hollow piston pins are $1\frac{1}{8}$ inches in

diameter and of hardened nickel steel. The deflector is cast integral with the piston and of an original form that is claimed to be proven better for this motor than any other known construction. The entire top of the piston is polished to prevent the accumulation of dirt and carbon.

The crankshaft is of nickel steel oil-tempered and ground, has five main bearings. Connecting rods are steel drop forgings, provided with large oil scoops on the big ends, and they are cut away on the top ends for spray lubrication. The transverse engineshaft and vertical pumpshaft are respectively driven by means of helical and bevel gearing from the forward end of the crankshaft, and a separate oil lead is provided for their lubrication.

In the cooling system the water circulation is maintained by a large centrifugal pump M. Fig. 2, which is driven by the transverse shaft at the forward end of the motor. This pump draws the cooled

water from a large square tube radiator, forces it through copper piping W, into the waterjackets, just below the exhaust valve chambers, from whence it makes its exit at the top in a conventional manner. A gear-driven fan assists in drawing air through the radiator. Lubrication is affected by means of a rotary pump which draws oil through a filter and a regulator from the reservoir of the crankcase and forces it through a large pipe L, Fig. 2. This main pipe is connected to the crankcase in five places and leads a stream of oil to each of the main bearings of the crankshaft; the oil entering into the top of an annular groove in the bearings and passing out at the bottom, then returning through filters to the oil tank. The rotary valves, pistons and connecting-rods are lubricated by means of a mist of oil contained in the fuel mixture. This oil is introduced into the fuel mixture by means of a separate lead which feeds oil into the center of the intake pipe. A sight is provided to show that the oiling system is in operation, and at the end of the oil line there is an automatic by-pass valve which increases the oil flow as the motor speed increases.

Ignition is by means of two distinct jump-spark systems comprised of an At-water Kent uni-sparker, dry-cells, and a set of plugs, for one; and a Pittsfield arc-flame magneto and a separate set of plugs, for the other. The uni-sparker T, Fig. 3, is driven by means of bevel-gears from the rear end of the rotary-valveshaft; and the magneto M, is operated in a similar manner from the transverse shaft in front.

Carburetor of Special Design

The Derain carburetor C is of special design, consisting of two venturi tubes and a vacuum-operated dashpot controlling the admission of auxiliary air. The operation of the carburetor is as follows: Gasoline is led to the top of the float-chamber F, by a $\frac{3}{8}$ -inch pipe; up to certain motor speeds, only the smaller tube which contains a single case-hardened steel nozzle, is used; when greater speeds are required, the second or larger tube is opened and multiple

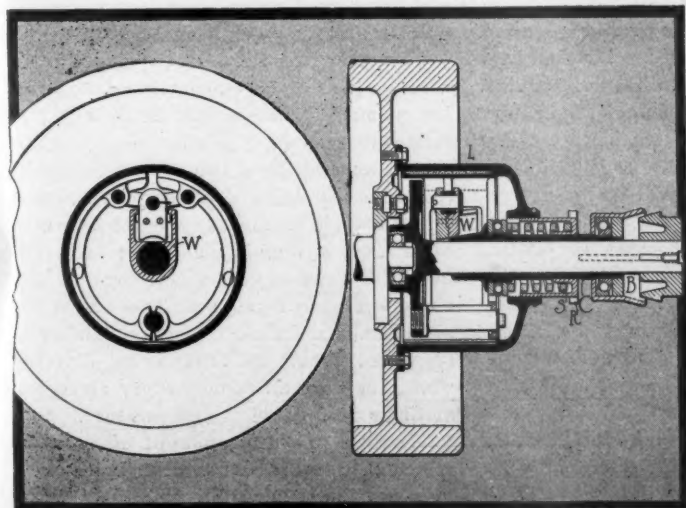


FIG. 4—MECHANICAL DRAWING SHOWING DETAILS OF DERAIN CLUTCH

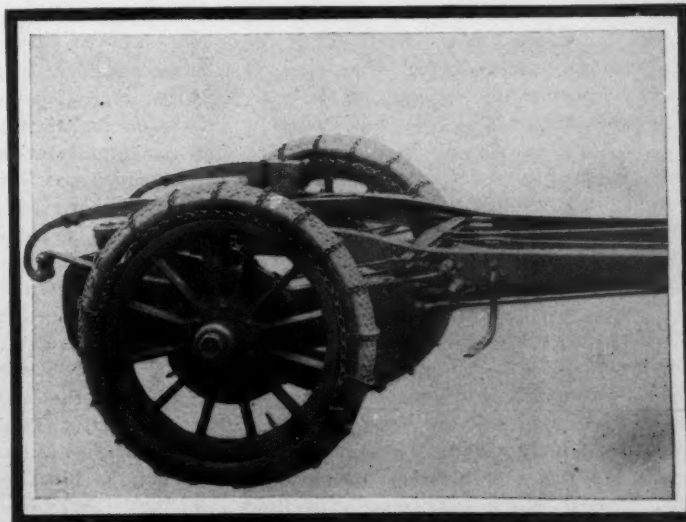


FIG. 5—SHOWING CONSTRUCTION OF REAR HALF OF DERAIN CHASSIS

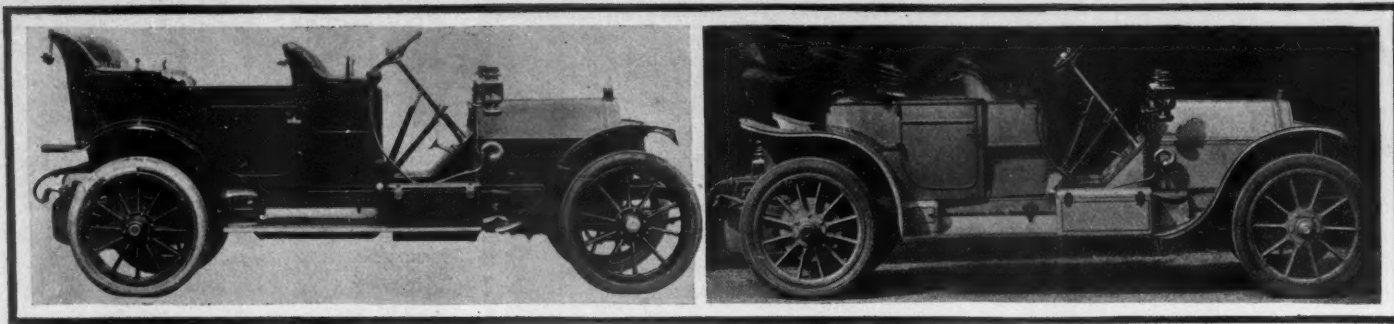


FIG. 6—BODY DESIGN OF DERAIN FIVE-PASSENGER TOURING CAR

FIG. 7—SHOWING BODY DESIGN OF DERAIN CLOSE-COUPLED CAR

gasoline jets are put into action. The bottoms of the venturi tubes are supplied with air shutters which may be used to control the vacuum on the gasoline nozzles; the opening of the auxiliary air valve compensates for varying motor speeds; the whole carburetor is so constructed that the gas flow is unobstructed. A portion of the intake manifold and practically the entire carburetor is jacketed for heat supplied directly from the exhaust pipe.

A mechanical drawing of the Derain clutch is shown in Fig. 4. The clutch shell L is bolted to the flywheel with eight cap screws, and by removing these screws the entire clutch assembly may be easily removed from the car. The toggle action for expanding the clutch segments is operated by the wedge W, at the forward end of the clutch sleeve C, which is pushed by the spring S. Nut R controls the spring tension and provides the only adjustment in the clutch assembly. The clutch shoes O, are faced with asbestos fiber; working parts are hardened and ground, and work without lubrication. A small cup and cone clutch brake B is provided to stop the rotation of the shaft and facilitate gear-changing.

From the clutchshaft, power is transmitted through a single universal joint to the propellershaft which is inclosed in a torsion tube. This tube, Fig. 1, is attached in front to a cross-member of the frame by means of a large globe-and-socket joint, which contains the universal of the propellershaft. The rear end of the tube is flanged and bolted to the front end of the transmission gearcase which is an integral part of the cast-steel housing of the rear-axle mechanisms. The gearset is small and compact, selectively operated and gives three forward speeds and reverse. Annular ball bearings are used throughout the gearset and rear-axle; and the axle is of a floating type which permits of the removal of all working parts without disassembling the axle from the car or disturbing the wheel adjustments. Two sets of brakes are provided, each set operating on individual concentric drums attached to the rear wheel hubs; and the drums are separated by an air space for cooling. The brake drums are of generous dimensions, and pressed steel equalizers extending across the frame are fitted to equalize the power and wear of both brakes.

The front axle is a one-piece drop forging with integral spring pads. The yokes are formed integral with the steering knuckles instead of with the axle so that the steering pin is of unusually large diameter and is brought nearer the center of the wheel. The steering arm is placed above the axle where it is less liable to injury and the tie rod is positioned behind the axle for the same reason. Front wheels are mounted on annular ball bearings with thrust bearings provided to take thrust loads. A worm and worm-wheel steering-gear is employed with both wheel and worm forged integral with their shafts and adjustably mounted on ball bearings. The frame is a heavy pressed steel construction with a $2\frac{1}{2}$ -inch drop in front of the rear-axle to lower the center of gravity. It has four cross-members, two for supporting the motor, one for the support of the torsion tube, and one at the rear end of the frame. Semi-elliptic front springs 2 inches wide and 38 inches long are employed; and the rear springs are three-quarter scroll elliptics $50\frac{1}{2}$ inches long and $2\frac{1}{4}$ inches wide. All spring eyes are bushed with bronze, have hardened nickel steel bolts, which are hollow and provided with grease cups.

The dashboard is of Circassian walnut, has two gauges—showing the oil circulation and air pressure on the gasoline tank; and a combination battery and magneto switch.

MITCHELL IN RUSSIAN SHOW

At the third annual Russian show which just closed its doors and which was held in the Michel riding academy of St. Petersburg the United States was represented by the Mitchell cars which were displayed in Russia for the first time and thus were one of the centers of special attraction to the crowd. The show, which was the best ever held in Russia, must, however, be called a huge German success, as the German manufacturers have been reaping a harvest of orders. Strange this, when it is considered that the show was promoted principally by Frenchmen having the Paris sporting paper *l'Auto* behind them. The cars that were on display besides the Mitchell were the Brasier, de Dion-Bouton, Panhard, Charron, Berliet, Renault, Gregoire and Rolland-Pilain, from France; the Pipe, from Belgium; the Fiat and Isotta-Fraschini, from Italy; the British Daimler-Knight and the Austin, from England; the Benz, Mercedes, Gaggenau,

Opel, Durkopp, Bussing, Dixi, Adler and Scheibler, from Germany, and the Saurer from Switzerland. Some of the exhibits consisted of a chassis or a complete car of every type made by a concern. Benz, Opel, Mercedes, de Dion-Bouton and the valveless Daimlers were the cars most conspicuous.

ENGLISH PUNCTURELESS IDEA

Benjamin F. Chase, American consul at Leeds, England, makes the following report through the Daily Consular and Trade Reports of the invention of a punctureless tire by an Englishman:

"It is composed of an inextensible heavy canvas lining, the crown being packed with a puncture-proof material and placed between the outer cover and the inner air tube of the ordinary pneumatic tire. The lining is so made as to cause a low pressure on the tread and to more nearly equalize the pressure on the inner air tube. The lining is thickest at the crown and tapers to a feather edge near the rim. The external appearance is like an ordinary tire. The inventor has given it drastic tests. He made several gashes and cuts on the outer cover of a tire through to the patent lining, and with these has driven his car 500 miles without a puncture or the necessity of repair on this tire, although wheels on the same machine fitted with other tires had the usual difficulties. Other tests on heavy cars without the special gashes have been equally satisfactory. An inspection of the invention impresses one with its simplicity, and the carved outer cover used proves its practicability.

"Another invention by the same man is a bridge tire of keyed-chamber design, for heavy motor vehicles. It is described as follows:

"In an all-rubber tire of almost square section is molded a double series of small triangular air chambers so keyed into each other that a radial line drawn from the hub of the wheel to its periphery at any angle must pass through at least one of the air chambers. Though every chamber is separated from its fellows by dividing walls, they are all connected by air vents, and may be inflated to any pressure. * *

* Twenty to 30 pounds of pressure is sufficient to insure all the advantages given by a continuous air tube, with none of the disadvantages inseparable from high pressure."



The Motor Car Repair Shop

Hints for the Amateur

IN Fig. 1, one method of straightening a slightly bent crankshaft is shown. This shaft is bent as indicated by the dotted line A, Fig. 2, only to a very much less extent, the bend not being visible to the naked eye except when the shaft is revolving in a lathe with a tool or other object held stationary, close to the center bearing surface. In testing for a bent crankshaft, one should not be misled by a bearing surface of the shaft that is probably worn out of round, the test should be made at the side of the bearing where little or no wear is liable to take place. There are few repairmen who will undertake to straighten a bent crankshaft, and by many it is claimed to be impossible to make a lasting repair to a shaft which is out of true. However, as the repairman is occasionally called upon to fix 't-up, the means generally employed is shown herein. As in Fig. 1, the shaft K is fixed between the centers C of a lathe, a block or blocks B, are placed upon the lathe-bed for a fulcrum, and a bar of iron R, or preferably of wood, is used as a lever. If an iron bar is employed a piece of brass, wood or lead should be placed between it and the bearing surface of the shaft for protection. Assuming that the shaft is bent as indicated by the dotted line A, Fig. 2, it is pried up with the bar R, till it assumes the position indicated by the dotted line B, and while held in this position an assistant holding a piece of brass M, on the bearing surface with one hand, and with a hammer in the other, strikes the shaft a sharp light blow. The bar and blocks are then removed, the lathe started, and the shaft tested again for results. This treatment is repeated again and again until the shaft is straight as indicated by the line C. It is generally a long and tedious job, depending greatly upon chance and the ability of the operator of the bar to guess the proper amount of pressure to apply and the proper place to apply it.

To Cool and Scavenge Motor

Motor Age wishes to remind the old, and advise the new motorists of the advantages of cutting out the ignition when coasting downhill, etc. By switching off the igni-

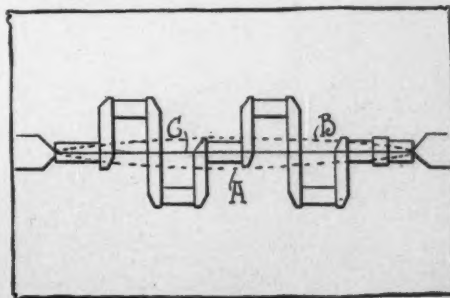
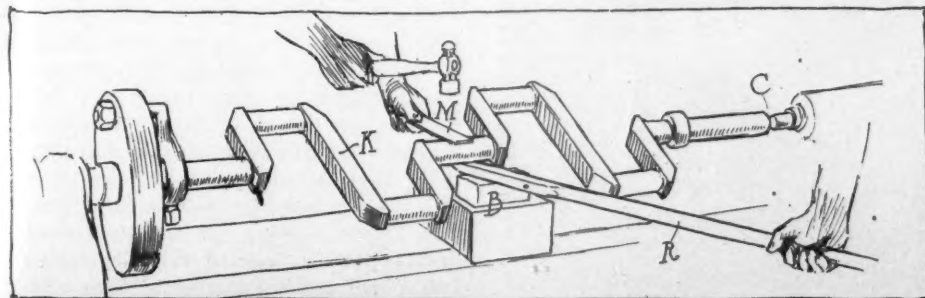
tion current on starting the descent of hills and then opening the exhaust cut-out and throttle of the carbureter, without disengaging the clutch, of course, a steady current of pure cool fuel mixture will be drawn through the cylinders, which is as refreshing to the motor as a lungful of fresh ocean air above decks is to the stoker as he comes up out of the boiler-room of the steamer. This practice cools the motor, cleans loose carbon and oil from the walls of combustion chambers, and spark plugs, and if reasonably carried out, is economical as well. The proper method of operation is to cut out the ignition, open the exhaust cut-out, then open the throttle wide and leave it open for a few seconds, after which the clutch should be disengaged, and the spark and throttle levers retarded as when about to crank the motor by hand; then as the bottom of the hill is approached or passed and the car begins to lose its momentum, switch on the ignition and let the clutch in gradually to start the motor. This also is practical on the boulevards of the city when slacking up at the approach of street railway crossings; use the motor for a brake by leaving the clutch in all the time that the ignition is cut out and keeping the throttle closed. It is advisable to disengage the clutch, however, just before switching on the ignition, to avoid strains on the crankshaft, transmission mechanism and rear-wheel tires, and inconvenience to the passengers.

Different Grades of Gasoline

It is not uncommon for a motor car to start on a tour with the gasoline tank filled with a good grade of gasoline and run most beautifully for the first 2 days or until a fresh supply of gasoline is taken on at some very small out-of-town garage or country store. Soon afterward there will be a noticeable loss of power which will have a most depressing effect upon the driver, and perhaps upon the whole party, if the driver happens to be a member of the family; for there is nothing more dispiriting to a party out for a lengthy ride than the impending gloom of possible

mechanical trouble. This loss of power accompanied by much difficulty in starting the motor in the morning, is most annoying to the unsophisticated because a thorough examination of all features of the power plant will reveal nothing, for there is nothing wrong with the motor; it is the fuel that is giving the trouble. The gasoline taken on either is stale from long standing, or contains water, or is otherwise of an exceptionally poor grade. In trouble of this kind, to facilitate starting drain a half to a cupful of gasoline from the float-chamber of the carbureter in the morning before trying to start to eliminate any possible accumulations of water therein; then prime the cylinders with gasoline, or hold a cloth saturated with it over the air intake of the carbureter while the motor is being cranked. The only remedy for the power loss is a slight adjustment of the carbureter until a fresh supply of a better grade can be obtained. The tourist should carry a hydrometer with which to test the gasoline he buys on the road. He should also watch his supply and replenish it in the larger towns or cities in preference to the country stores. Gasoline testing 68 degrees specific gravity, or 76 degrees Baume scale, is about as good a grade of gasoline as can be obtained anywhere, but one should avoid if possible the use of fuel whose specific gravity falls below 59 or 60 degrees, which is equivalent to about 98 degrees Baume.

The ratio of the density of any substance to the density of water is called the specific gravity of the substance. And the specific gravity of liquids may be conveniently determined by means of an hydrometer, which consists of a straight stem of glass, with a bulb at the bottom, and weighted so as to float to the proper depth in a vertical position. The stem of a hydrometer is graduated in such a way that when the instrument is immersed or floated in a liquid, the graduation, which is on a level with the surface of the liquid, either gives the specific gravity directly, or a figure from which the specific gravity may be determined. There are two common types of hydrometers, the direct reading type, and the Baume type.



FIGS. 1 AND 2—SHOWING A METHOD OF STRAIGHTENING A BENT CRANKSHAFT INCLUDING DETAILS OF THE OPERATION

From the Four Winds

ELLIOTT Chauffeur Examiner—Fredrick H. Elliott is chief of the bureau of chauffeur examiners in Greater New York, under the new law.

Ione Sees Its First Car—F. G. Plummer, of the Northwest Buick Co., Portland, Ore., recently drove the first motor car into Ione, Ore. A number of the inhabitants never before had seen a motor car.

Great Western in the Munsey—The Great Western Automobile Co. has entered a car in the Munsey tour which starts from Philadelphia August 15. The company probably will enter the same car in the Munsey as made the Glidden tour. Clarence LaMar will drive.

Orphans' Day at Syracuse—While no arrangements are yet completed for orphans' day in Syracuse, N. Y., it is expected the Automobile Club of Syracuse will hold it on some day the latter part of this month, pursuant to the yearly custom. Secretary Forman Wilkinson will have charge of the arrangements.

Another Show for Detroit—Plans are well under way for a motor car show which will take place at the coming Michigan state fair at Detroit, September 19-24, in a new \$40,000 building of two floors, which is being built now on the state fair grounds. Walter R. Wilmot has been secured by the Michigan fair management to manage the motor car department and show. In all there will be 70,000 square feet of space available in the new building. A meeting of the D. A. D. A. was held last week when Manager Wilmot explained his plans. The accessory dealers are showing an unusual interest in this

show and many applications have been received already for space. There will be a liberal allotment of space to electrical firms and to motor boat displays also.

Races to Muskegon—Winners in the matinee track races of the Gentlemen's Driving Club of Muskegon, Mich., on the Fourth included the Hupmobile, Henry and Brush.

Omaha Remembers Children—Omaha motorists gave the little children of the social settlement a motor ride last week. They made the ride to Fort Calhoun, a distance of 15 miles, leaving at 9 o'clock in the morning and returning at 4 in the afternoon.

Omaha After a Track—The Omaha Motor Club, of Omaha, Neb., which was organized to promote a new mile racing track, has incorporated with a capital stock of \$10,000. The officers are: Ole Hibner, president; C. L. Gould, first vice-president; W. J. Kirkland, secretary; Eugene Silver, treasurer; directors, W. D. Hosford, W. L. Huffman, George F. Rheim, L. E. Doty and Otto P. Nestman.

Seattle Issues Road Book—Under the supervision of Clarence Hanford, president of the Automobile Club of Seattle, that organization recently has issued the road book of the club and its year book. The road book, of which this is the second edition, has been changed somewhat from last year's publication. In the book issued for 1909-1910 the district was covered more as a whole, while this year the maps are arranged to show the local runs to greater extent. All the maps are completely indexed and cross-indexed so they

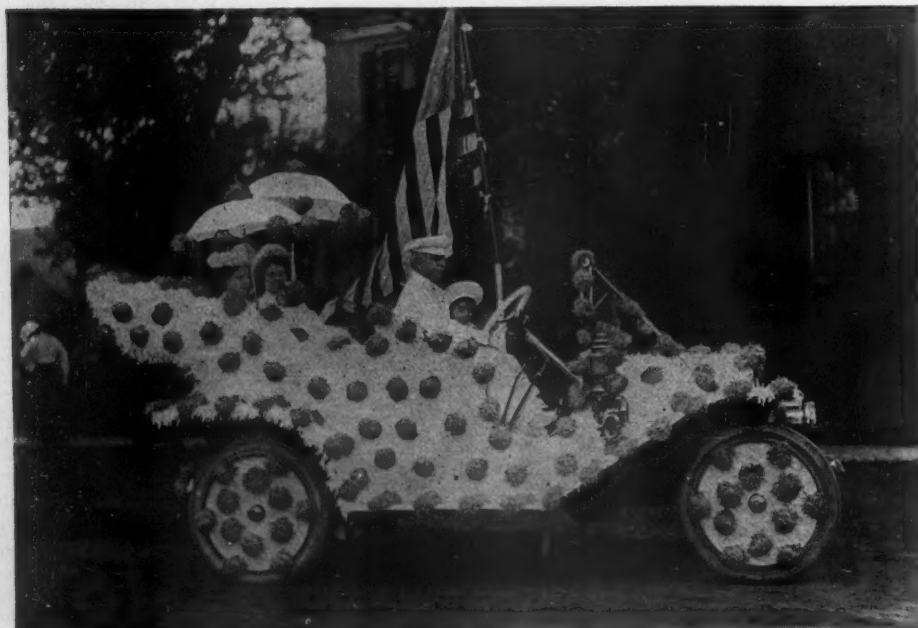
may be readily connected. The book contains fifty-six plates showing different routes in and around Seattle, Tacoma, Portland, Victoria, Vancouver, Bellingham, Aberdeen and Olympia.

Ohio's Report—According to the report of the Ohio state registrar of motor cars for the month of June, 2,378 owners registered motor cars, paying in fees of \$11,672. Chauffeurs to the number of 450 were licensed and manufacturers and dealers to the number of twenty-two were registered. The total receipts for the month were \$13,081.50.

Races for Ocean City—Aroused to action by the success of the North Wildwood Automobile Club's Independence Day meet, other Jersey coast resorts are commencing to realize the advantages to be derived from holding motor car races. The latest of the watering places to fall in line is Ocean City. A motor club was recently organized and held its initial run last Saturday to Cape May. Encouraged by the success attending the first effort, arrangements are now being made for a race to take place within a few days.

A. A. A. Sends Delegates—Two delegates of the American Automobile Association are now on their way to Europe to attend the annual congress of the International League of Touring Associations. Howard Longstreth, chairman of the good roads committee of the Automobile Club of Philadelphia, and W. O. Griffith, chairman of the touring information committee of the same club, are the A. A. A. representatives who will be met at Brussels on or about July 28 by Victor Breyer, the A. A. A. representative in Paris. The L. I. A. T. congress will continue from July 28 to August 1, and will be participated in by delegates from national touring bodies of their respective countries.

Boon for Tourists—Charles G. Guyer, of Wilmington, Del., has been commissioned deputy motor vehicle commissioner for the state of New Jersey, in Delaware, with authority to receive license money and issue certificates and tags entitling the holders to use New Jersey roads. Mr. Guyer is secretary of the Delaware Automobile Association. The establishment in Delaware of a New Jersey motor license bureau is a great accommodation, not only to Wilmington machine owners and drivers, but also to those from other states passing through New Jersey from the south, as it enables them to pay the license and get the necessary tag and certificate here before crossing the Delaware river. Persons merely desiring to tour through Jersey will not be required to take out a year's license, as fractional licenses are



G. C. BOLLINGER'S PRIZE-WINNING E-M-F IN PARADE AT SHELBYVILLE, ILL.

issued, the minimum period being 8 days, which can be divided into two periods of 4 days each if the holder of the license so elects. The fees are regulated by the power of the car.

Oakland and Buick Win—A large crowd witnessed the races held at Coshocton, O., July 4. Barnes in an Oakland won the 3-mile race in 4:51, and Baker won the next race of the same distance in a Buick in 5:13.

Now Using a Motor Car—The two young sons of Jack Abernathy, United States marshal of Oklahoma, who recently distinguished themselves by riding bronchos from Oklahoma City to New York, carrying a message to Theodore Roosevelt, are returning home in a Brush runabout, which is being driven by the elder boy, aged 9. The other boy is only 6 years of age. Their father is with them, driving a Maxwell.

Reliability for Cleveland—At the suggestion of Cleveland dealers the News, of Cleveland, O., has laid plans and secured the American Automobile Association's sanction for a reliability contest. One contest will start Monday, July 25, and will be a 3 days' run. Starting from Cleveland the run will take in Columbus, Toledo and Cleveland again on the first, second and third day's run respectively. The contest will be held under the rules of the A. A. A. and under the flag of the Cleveland Automobile Club. For each class decided upon the News will donate a silver trophy cup.

Portland Club Run—More than 100 members of the Portland Automobile Club made the run to Tillamook, Ore., in 10 hours July 3. They were taken in tow by the McMinnville Commercial Club and treated to a banquet before they could continue on their way to Bay Ocean Park. From McMinnville to Willamina there is a good macadam road and signboards have been put up along the roads by the McMinnville Automobile Club under the supervision of G. S. Wright, who piloted the party along the road. This is the first of a series of runs which will be taken by the club members during the summer, and was a complete success.

Minneapolis' Next—Preparations for the second annual tour of the Minnesota State Automobile Association have progressed far enough to indicate that the trip is to surpass even the pleasurable jaunt of last year to Fargo and return. Entries for Minneapolis already are near thirty, and the number will be increased materially. The run this year, as last, will extend over 5 days, the intervening Sunday being designed for rest at Sioux Falls, S. D., the turning point. The tour will start the morning of July 22 at St. Paul, and will end the following Tuesday night in Minneapolis. The run will be for the Dispatch trophy, now held by the Brush, and for other trophies. Among the entries already filed are the following: Minneapolis—E-M-F, Halladay, Chicago-Staver,



STUDEBAKER-GARFORD THAT WON FLORAL PARADE PRIZE AT PORTLAND, ORE.

Brush, two Maxwells, Krit, Schacht, Stearns, Jackson, Reo, Regal, Cadillac, Royal Tourist, Falcar, Ford, Halladay, Jackson, Regal.

Wisconsin Registration—On July 10 the total registration in Wisconsin had reached 14,750, an increase of more than 85 per cent over the figure on the same day in 1909. Applications are coming at the rate of fifty a day.

Racing at Webster City—Fast time and exciting finishes at Webster City marked the first motor racing ever held in this part of Iowa, when on July 4 three motor races and one motor cycle race was pulled off on the ½-mile track owned by the Webster City Driving Park Association. R. Jeffkins in the Overland was the star of the day when he won the 10-mile event in 12:34, remarkable when the condition of the track is known. Barnett in an Overland and Brown in a Mitchell won the other two races.

To Climb Long Hill—Unique in some particulars is the reliability contest and hill-climb now being promoted by the Motor Contest Association, which is scheduled to take place July 16-18. The tour will start from Edgewater, N. J., and the finish will be at the village of Catskill. The route is about 275 miles. The start will be at 7:30 o'clock sharp, from Times square, New York, where the competing cars will assemble for transportation to Edgewater. Sunday will be spent in pleasure riding and rest or recreation in the hills and Monday morning the hill-climb will be staged. In only one of the events will cars be allowed to participate that did not take part in the run from New York. That is No. 8 on the program, open to amateurs who own cars at Catskill and within a

radius of 15 miles of Kaaterskill Clove mountain. There are ten other events carded under price and piston displacement classes. No free-for-all will be run.

Six-Hour Race Billed—Announcement is made by the Quaker City Motor Club that it will on Saturday, August 6, conduct a 6-hour track endurance run at the Point Breeze, Philadelphia, track. The event will be open to stripped cars of class C, divisions 1 to 6 inclusive, for which the entrance fee will be \$100. Two prizes will be awarded, the winning car to receive \$750 and the second car \$250—\$1,000 in all.

Keeps Tap on City Cars—Harry E. Briggs, commissioner of public works of Milwaukee, Wis., has put into effect a plan to keep close account of the cost and mileage of all cars owned by the city, fourteen in number. Mr. Briggs believes he can stimulate municipal chauffeurs to produce great mileage at minimum cost. As a reward he proposes to let them run 50 or 60 miles a week over the mileage required on official trips.

Sets Watson Cup Date—The committee in charge of the annual club run of the Syracuse Automobile Club, of Syracuse, N. Y., for the Watson trophy, has definitely set the date of the run from Rexford Falls and return on July 20. The trophy will be captured by the driver hitting closest a secret time set by the committee. Contenders will leave the Syracuse courthouse at 8 a. m. and proceed to the Spring House, at Rexford Falls, Chenango county, going via Oran, Cazenovia, Erieville, Eaton, Earlville and Sherburne. After dinner the return will be made via Hamilton, Pecksport, Pine Woods, Morrisville, Cazenovia, Chittenango and Fayetteville. Great interest in the run is being shown.



SIX-WHEELED MOTOR TRUCK

A SIX-WHEELED motor truck has been recently completed by James W. Linn, assisted by his father, B. F. Linn, both of Oregon City, Ore. This giant truck carries 16 tons of lumber or anything else at a minimum speed of 10 miles an hour. This means that 5,000 feet of lumber can be hauled on the truck at a load, which is two and a half times the amount that can be piled on a wagon. The truck can travel twice as fast as a team, and can be operated at a cost of about 6 cents per mile. The truck weighs 3 tons, has a 60-horsepower Thomas gasoline engine which is geared 74 to 1, giving it a pulling power of 15 tons on low gear. There are six wheels, four of them being direct-drive wheels. A special feature is the adjustable sprocket wheel on the axle of the first pair of drive wheels, which allows the rear wheels to be on a direct drive and at the same time swing, allowing the machine to be turned around in much smaller space than if the long body were stiff. The wheels are 40-inch steel wheels with 12-inch tires, and are fitted with heavy shoes. There is a 30-gallon gasoline tank and a 60-gallon tank for water. A 24-horsepower marine engine was tried at first, but it was impossible to keep it cool, and the Thomas engine was installed in its place.

MAKING GOOD ON THE COAST

The success of the motor truck delivery in Seattle, Wash., has been pronounced. On all demonstrations motor trucks easily have proved that long distance deliveries can be made at very much less expense than by the old-fashioned way. A 2-ton truck that has been on the Green lake district for the Schwabacher Grocery Co. has averaged more than 48 miles per day with full capacity loads of 2 tons, without missing a single trip since the first day of April, making every delivery outside the paved district, at an average daily cost of \$1.42 for gasoline and lubricating oil, with less than \$5 repairs for the entire 2 months' deliveries up to June 1. The Grote-Rankin Co. installed a motor delivery truck to haul furniture and found after the first week's work it was able to lay off three delivery horse teams. The truck is saving the entire expense of two teams and drivers.

NEW ONE IN DETROIT

As showing the growing tendency among manufacturers, the two latest companies established in Detroit will specialize on delivery wagons, and both of about the same size, 1,000 to 2,000 pounds. The Bailey Motor Truck Co., incorporated with a capital stock of \$100,000, has a strong backing and will go right ahead with the

manufacture of delivery wagons. One wagon of 1,000 pounds capacity has already been built and has traveled upwards of 2,000 miles. This is a four-cylinder machine with the motor in front, under a hood, double-chain drive, solid tires, and left-hand control. Officers of the new firm are: Thomas E. Reeder, president; C. W. Baird, of Baird & West, treasurer; E. R. Stoughton, also of Baird & West, secretary; and L. E. Bailey, manager. Mr. Bailey is in charge of the shop, a one-story building, 40 by 100 feet. This is located on Kirby street, next to the Kirby plant of the Kelsey Herbert Co., maker of bodies.

DRUMMERS TAKE TO CARS

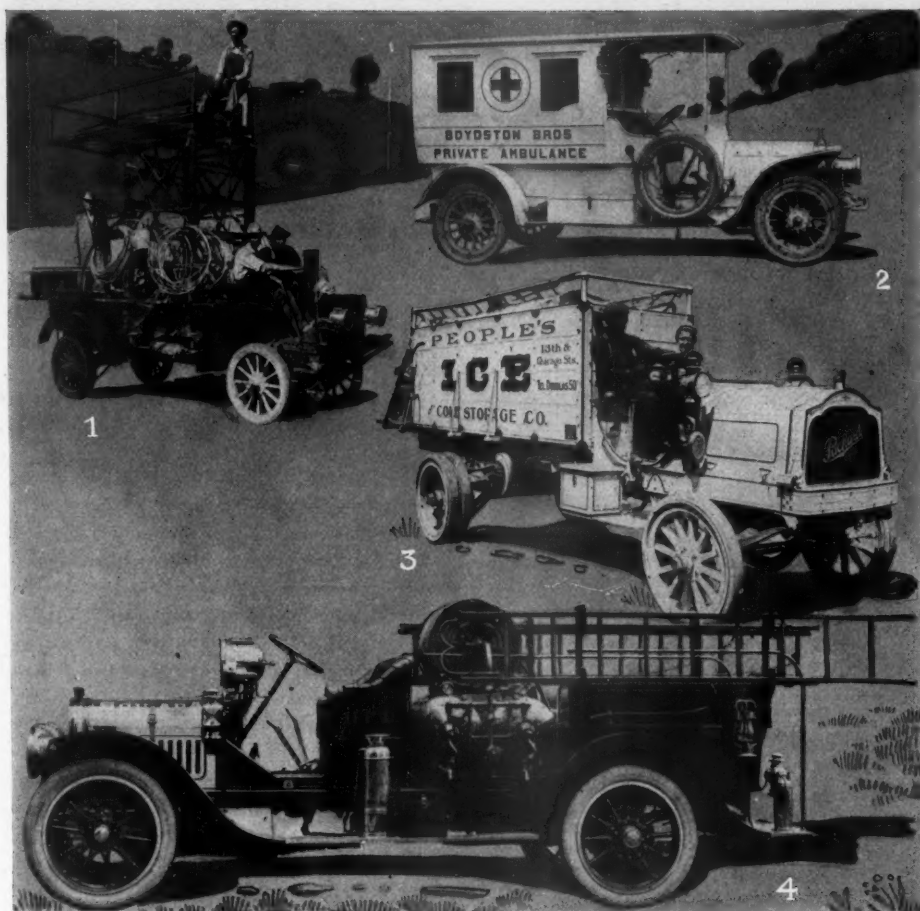
The motor car is coming into general use by traveling salesmen whose territory embraces the west Texas and New Mexico territory where many of the towns are situated some distance off the railroads. In several instances the commercial travelers are furnished with the motor cars by their respective houses, while others own their own machines. It is claimed by these men that the introduction of motor cars for the practical purpose of getting about

from place to place has served as a wonderful trade developer. The commercial traveler who uses a car is able to cover two or three times as much territory within a given time as under the old method of depending on stage lines and liverymen to convey them from town to town. It is claimed that the motor cars beat the railroad trains when it comes to the rapid making of towns. Instead of having to wait perhaps several hours when he is through in a town to catch a train, the commercial traveler jumps in his machine and makes a quick run to the next town. If a customer happens to be 10 or 25 miles out in the country looking after his farm or on some other business the drummer goes out and sees him, taking his sample cases along in the motor car.

The use of the motor car by commercial travelers is rapidly revolutionizing trade conditions in the southwest. It is predicted that in a few more years practically every man who makes this territory will travel by this method. Enterprising houses already find it so convenient and less expensive than the old method of paying stage fare and hiring livery rigs that they



1—WAVERLEY ELECTRIC HEARSE USED BY A. S. BENTLEY, CHICAGO 2—BAKER ELECTRIC DELIVERY WAGON USED AT THE WHITE HOUSE, WASHINGTON 3—STODDARD-DAYTON AMBULANCE 4—SPECIAL MAIL AND EXPRESS CAR USED IN BRITISH COLUMBIA



1—TROUBLE WAGON OF STREET CAR COMPANY AT OMAHA 2—AMBULANCE FITTED WITH FISK DEMOUNTABLES USED BY A CHICAGO UNDERTAKER 3—PACKARD ICE WAGON IN SERVICE IN OMAHA 4—POPE-HARTFORD FIRE WAGON RUNNING IN HARTFORD, CONN.

are equipping their men with the machines rapidly. Competition will force the slow-going ones to adopt the modern vehicle as a means of transportation for their men. So extensive has the use of motor cars become in the ranch territory of the southwest that garages have been established in every town of a few hundred inhabitants and no trouble is experienced in getting repairs promptly made.

NEW LINE FOR ST. LOUIS

The Auto Transit Co., of St. Louis, has been formed, with J. J. Quinn the moving spirit. The company will incorporate for \$25,000, the papers having already been prepared. Mr. Quinn announces that he will start a 5-cent fare line from the city limits to Bailas road, a distance of 2½ miles. The new line is designed to carry passengers to the new suburban residence division of Winchester park, and will be the first of its kind established in Missouri. The new district was isolated, as it is 2½ miles from the nearest car line from the city. The motor line, it is declared, will be a great aid to the real estate business in that section. The line will be conductorless, the Van Note tabulators and registers being substituted. Passengers will enter at the rear of the cars and alight from the front. The Van Note tabulators act in the manner of turnstiles, and are much in use on suburban

car lines in many parts of the country. The incorporators of the company are to be J. J. Quinn, H. L. Van Note, W. D. Helman and William A. Estep.

MOTOR LINES IN MEXICO

The movement to construct motor roads is spreading rapidly in Mexico. The governors of the different states are giving the matter their personal attention, with the result that remote localities which formerly were difficult of access and seldom visited by the ordinary traveler are now placed in close touch with the channels of commerce. In the states of Guerrero and Chiapas particularly have the construction of modern highways resulted in great benefit to the rural communities reached by them. While the rainy season interferes somewhat with the operation of regular motor service over some of these new roads the condition of the latter are splendid during the greater part of the year.

In the state of Sonora, in northwestern Mexico, a motor highway, 90 miles long, has just been finished. It runs between Nogales, on the Mexico-United States

border, and the town of Altar, the seat of government of the Altar district. The road was constructed with funds subscribed by the business men of Nogales. The motor service over this new road is in charge of H. J. Karns and W. E. Karns. The 90-mile trip is made in 6 hours, a car going to Altar one day and returning the next.

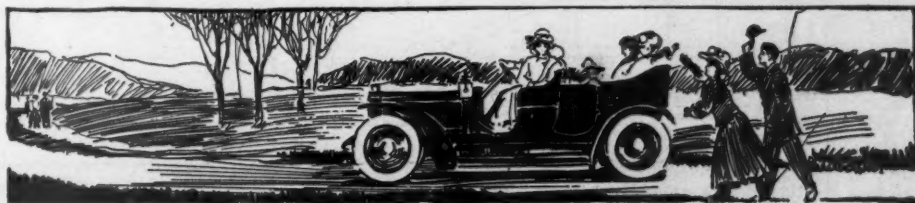
The opening of the Nogales-Altar highway marks the beginning of an extensive motor service that is to be inaugurated out of Nogales. It is planned to establish a regular service between Nogales and Boludo, 36 miles, and to later extend the line to La Cienega, 56 miles. The extension of the Nogales-Altar highway from the latter place to Port Lobos, on the Gulf of California via Caborca is under consideration. Rich gold placers are being operated in the Altar district and there is much travel to and from the mines.

BRODESSER MOVING TO JUNEAU

The Brodesser Motor Truck Co., Weil and Burleigh streets, Milwaukee, Wis., will on January 1, 1911, locate at Juneau, Wis., a small city on the Chicago & Northwestern railway, a few miles south of Minnesota Junction, where the Chicago, Milwaukee & St. Paul road crosses the Northwestern. The decision to move the plant from Milwaukee was made late last week, after the proposition made by the company to the business men of Juneau was accepted. The present plant in Milwaukee will be used as a factory by the Variable Speed Transmission Co., formerly the Variable Speed Clutch Co. Work has been started at Juneau on the construction of a new plant. The main building will be 60 by 200 feet in dimensions, of brick and concrete, strictly fireproof. It will be ready in December, and in operation by January 1. The annual production of the Brodesser Motor Truck Co. will be increased to 500 per year in the new plant.

BADGER BUS LINE

The first motor bus line to be established on schedule passenger transportation work in Wisconsin is now being operated between Ripon and Green Lake, Wis., by the Ripon-Green Lake Auto Bus Line Co. The fare for the 30-minute trip is 40 cents; round trip, ticket not transferable and good only on day of issue, 75 cents; ten tickets, good either way until used in any hands, redeemable if not used, \$3.75. Passengers living inside city limits of either Ripon or Green Lake will be called for and returned to residence without charge. Green Lake is one of the best summer resorts in central Wisconsin and many Chicago people spend the season on the lake.





Current Motor Car Patents

Rear Axle Housing Truss—No. 961,406, dated June 14; to Delamere B. Gardner, Chicago, Ill.—The device to which this patent relates is a reinforcement for the attachment of the torsion-tube of a shaft-driven motor car, to the bevel-gear and differential housing of the rear axle. As shown in Fig. 1, it consists of a tapered sleeve S, with two slotted ears E, and a grooved truss-rod R, which encircles the flanges of the halves of the bevel-gear and differential housing. The sleeve S is placed on the tapered torsion tube as illustrated, and the ends of the truss-rod slip into slots or holes in the lugs or ears E; the nuts on the ends of the rod are then drawn up and the flange F of the torsion tube T is thus greatly reinforced.

Carburetor Blows Horn—No. 961,158, dated June 14; to Robert M. Pierson, Bronxville, N. Y.—This patent relates to a combination of a horn or warning signal of the reed type, such as is now extensively used on motor cars, and a means of connecting it up to the air intake of the carburetor so that the suction may be used to operate it. The illustration Fig. 4 shows an ordinary type of horn H, attached to the frame of a car opposite the radiator with its air tube attached to the air inlet pipe A of the carburetor. In operation, when the driver presses the foot-button P and the motor is running, the regular air inlet opening B is closed, the opening C, to which the horn tube is attached, opened, and a strong current of air is drawn through the horn. Of course, the reed in the horn is reversed, on account of the reversed direction of the air currents.

Hydraulic Transmission—No. 961,372, dated June 14; to Albert F. Rockwell, Bristol, Conn.—The motor vehicle covered by this patent is quite unique in that it is a radical departure from the conventional. Power is transmitted from a motor of conventional design to a fluid pump, and this pump forces fluid under pressure to fluid motors on the rear axle ends, which drive the rear road wheels.

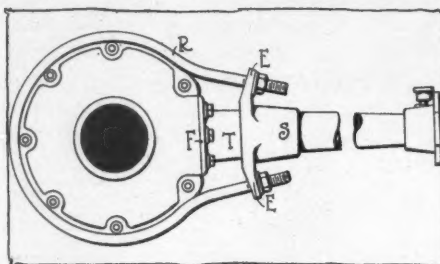


FIG. 1—REAR AXLE HOUSING TRUSS

The arrangement is illustrated in Fig. 3, and is a combination of a main frame F, supporting the motor M, and a wheel frame, comprising a transverse tube T,

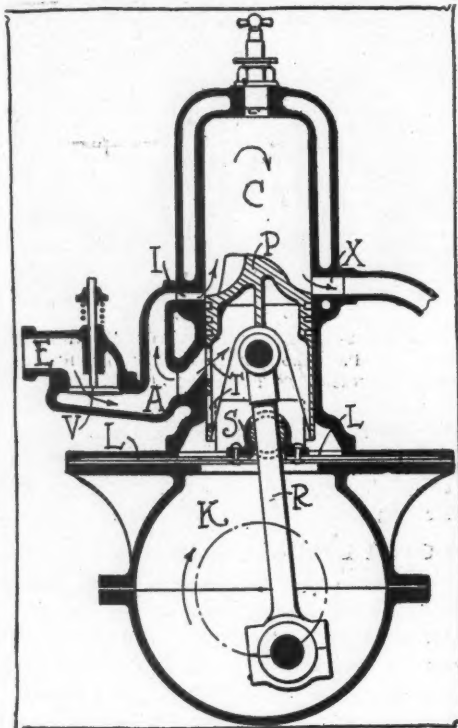


FIG. 2—TWO-CYCLE MOTOR

which forms the rear axle; a longitudinal tube L in communication therewith, and side tubes S, which are rigidly attached to and also indirectly in communication with

the other tubes. These tubes are rigidly attached to form a unit by means of the pump P, in front, and the fluid motors FM, behind; and this unit is flexibly connected to a cross-member of the main F. In operation, the fluid passes from the pump P, through the longitudinal and transverse axle tubes to the fluid motors which drive the wheels, and returns to the pump through the side ones, as indicated by the arrows.

Two-Cycle Motor—No. 961,315, dated June 14; to Armand Peugeot, Tony Huber and Henri de Lostalot, Billancourt, France.—The two-cycle motor covered by this patent is interesting for the method employed in forcing the fuel mixture into the cylinder without using the crankcase for this purpose. It consists of a sliding plate L, which is pierced by the connecting-rod R, and forms a gas-tight partition between the lower end of the cylinder and the crank-chamber. Thus, the lower end of the cylinder below the piston and the gas passages A act as a charging chamber. In operation, when the piston P moves upward, the charge above it is being compressed; at the same time a vacuum is produced in the lower portion of the cylinder below the piston and in the gas passages A, which are put into communication by means of the ports T in the piston. This vacuum opens the valve V, and draws a fresh charge of fuel from the carburetor, which is attached at the end of the inlet pipe E. As the piston reaches the upper end of its stroke, the charge compressed above it is ignited, combustion takes place, the piston is forced downward, the valve V automatically closes, and the gaseous mixture below the piston and in the gas passages is compressed. Nearing the bottom of its stroke, the piston uncovers the exhaust opening X and allows the burned gases to escape; further down and at the end of the stroke the inlet opening I is uncovered, and the fuel compressed in the gas-passages A and below the piston are admitted to the explosion chamber of the cylinder.

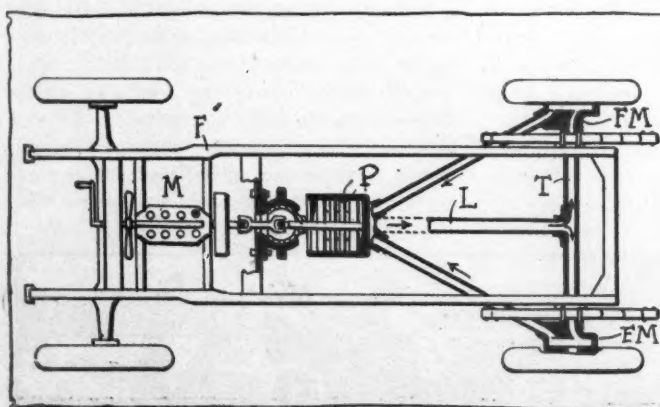


FIG. 3—MOTOR CAR WITH HYDRAULIC TRANSMISSION

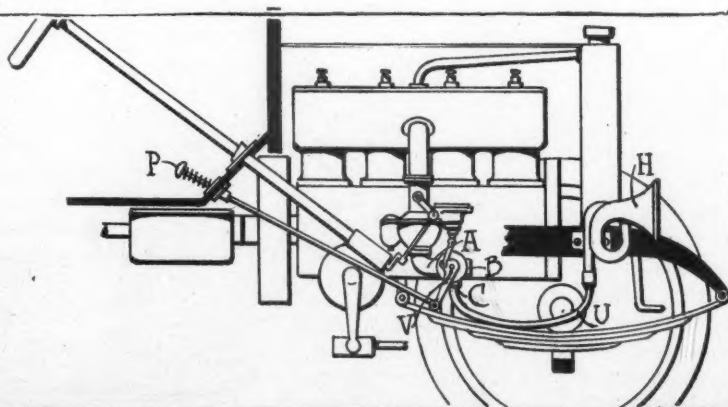


FIG. 4—MAKING THE CARBURETOR BLOW THE HORN



Development Briefs

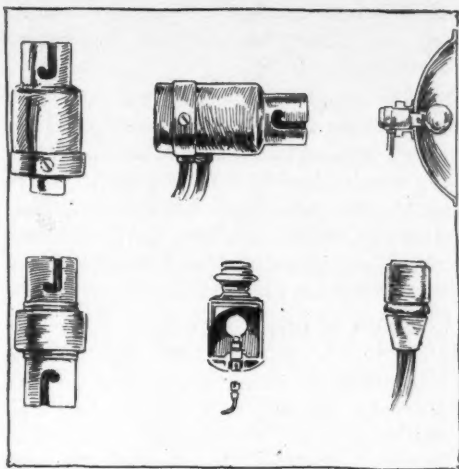
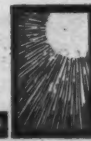


FIG. 1—WILLARD ELECTRIC-LIGHT SOCKET

Holds Bulbs in Place

THE Willard Storage Battery Co., of Cleveland, O., is offering a socket for use in connection with the electric-lighting of motor cars, in which the lamp does not depend on friction to hold it in position. This socket, Fig. 1, requires lamps fitted with the Edi-Swan base, the pins of which engage a bayonet catch on the socket, the lamp being locked in place by plungers which also carry the current to the lamp. For headlight purposes a socket is used which slips into a sleeve at the apex of the parabolic reflector. The socket may be moved forward or backward for adjustment of focus and locked in place by means of a compression clamp. In side and tail-lights a double-end socket is placed in a vertical position, one end carrying the lamp and the other engaging an attachment plug also fitted with pins similar to those on the lamp base.

White Gasoline Coupe

The latest addition to the White Co.'s line of steam and gasoline cars and motor trucks is a new type of closed car known as the White gasoline coupe. This coupe is designed especially for the use of those who desire the pleasure of driving their own cars, but wish protection from the weather. The steering wheel and operating levers are located within the closed body and the operator, as well as the other passengers, is thus afforded protection from the rain and cold. At the same time, all the exhilaration of an open car may be enjoyed by lowering the windows into the wainscoted panels. The interior arrangement makes possible a door on both sides, thus permitting entrance to the coupe, from the curb, on either side of the car. The distinctive feature which makes this double entrance possible, is the convenient seating arrangement. The operator's seat can be folded back against the

steering wheel, in order that ample room may be permitted for entrance or exit through the door on the right side of the car. There is a seat in the rear facing forward and a single seat alongside of the operator, thus this coupe accommodates four occupants with ease.

Bosch Horizontal Coil

The Bosch Magneto Co., New York, introduced to the American market during the recent show circuit, its dual ignition system, in which a horizontal dash coil C is used in place of the vertical coil carried on rear of the dash. As the illustration, Fig. 3, shows, the horizontal coil leaves a clean dash, the only parts appearing being a switch lever L and a press button B for starting purposes. This horizontal coil is made on the same principle as the vertical type. The connection plate P on the forward end of the coil contains six terminals, designated 1, 2, 3, 4, 5 and 6, No. 6 being a frame terminal. It will be noticed that a 6-volt battery is used in place of a 4-volt employed on the other systems. An important difference in this horizontal coil is that it is possible to start the engine no matter in what position it comes to rest. Those who inspected this device at the motor shows may have noted this point.

Women's Motor Glove

The Fried-Ostermann Co., Rockford, Ill., is bringing out this season a motor glove for women. This glove is of the combination wrist-fit design with a large cuff of sufficient size to receive the cuff of the coat sleeve. Around the wrist is a tension strap by which the glove can be made to fit snugly at this point. This is a leather glove and in every respect a duplicate of



FIG. 2—NEWLIN LIGHT ATTACHMENT

that manufactured for men. The tension strap is designed to make the glove fit snugly without being at all uncomfortable.

Electric Light Attachment

One of the latest devices brought out for converting motor car oil lamps and making it possible to use electricity is the device brought out by W. D. Newlin, 1426 Michigan avenue, Chicago. As may be seen by Fig. 2, the attachment consists of a bracket to which is fastened the incandescent bulb, the bulb being allowed to hang downward, in order to prevent a breakage of the filament. This idea also places the bulb where ordinarily the blaze of the oil burner would be, centering the light of all the reflectors. The attaching bracket is made of spring brass and is held securely to the burner by means of a small screw, which permits of the easy removal of the bracket in case it is desired to use the oil burner.

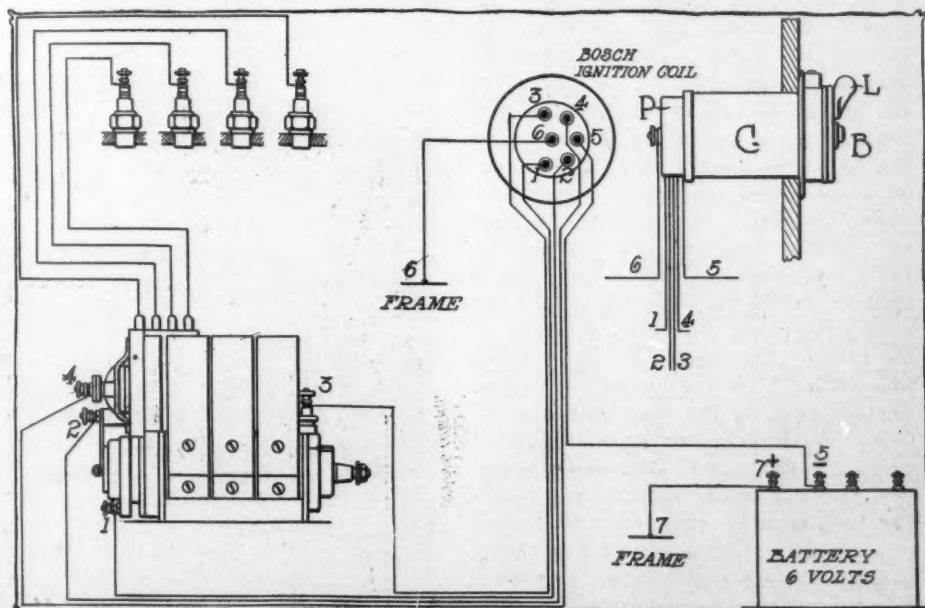
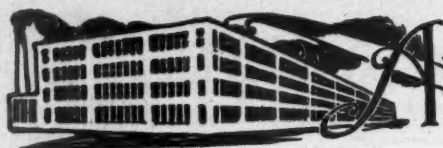


FIG. 3—DIAGRAM SHOWING WORKINGS OF BOSCH HORIZONTAL COIL



Among the Makers and Dealers

WINNINGHAM a Hudsonite—C. C. Winningham, of Chicago, goes to Detroit July 20 to be advertising manager of the Hudson Motor Car Co.

Wolfe Makes a Change—Maurice Wolfe, who has been acting as mechanical engineer and factory manager for the De Temple Motor Co., Anderson, Ind., has become general manager of the Clark Motor Car Co., of Shelbyville, Ind.

Regal Establishes Branches—For the last 6 months the Regal Motor Car Co. has been busily engaged in the establishment of branch houses. For over 2 years the Regal company has owned and operated a branch house in Detroit. The branches of the Regal Motor Car Co. that already have been established are located in Detroit, Buffalo, Boston, New York, Philadelphia, Kansas City, Wichita, Oklahoma City, Chi-

cago, Denver, Minneapolis, Indianapolis, San Francisco, Toledo, Lincoln, Neb., and Toronto, Ontario.

Bennet Now a Cole Man—Albert Bennet, who has been sales manager for the Colt-Stratton Co. of New York, eastern distributor for the Cole, has taken charge of the interests of the Henderson Motor Sales Co., of Indianapolis, Ind., and in addition to his work to handle the Cole car in the east, will look after the interests of the Westcott.

Owen Will Sell Reo Trucks—That R. M. Owen & Co., of New York, who have the contract for the sale of the Reo pleasure cars, also will have charge of the selling end of the new truck business which the Reo company is about to enter is the announcement made at the office of the Reo company, following a visit from R. M. Owen. It is probable that the manufacture of trucks will be begun about September 1.

Pulcher Quits Oakland—Martin L. Pulcher has resigned his position as secretary and treasurer for the Oakland Motor Car Co. The resignation was to take effect July 1, but he will remain with the company until his successor is appointed from the general office of the General Motors Co. in New York. He announces that he is leaving the Oakland company to turn his attention to the manufacture of commercial trucks. He is interested in the formation of a new company. It is proposed to manufacture a 1-ton truck. Detroit capital has been interested, and the project is said to be well on the way to

materialization. Mr. Pulcher is endeavoring to locate the proposed factory at Pontiac.

New Spark Plug Company—The Ball Multi-Spark Plug Co. has opened a factory at 917 Hennepin avenue, Minneapolis, for the manufacture of a newly-patented spark plug. The company, which comes from Aberdeen, S. D., is headed by A. H. Pease and W. M. Pease, and has a capitalization of \$100,000, of which \$50,000 is paid up.

Change of Name—The Racine Gas Engine Co., of Racine, Wis., has filed an amendment to its articles of incorporation changing the name to Racine Tool and Machinery Co. H. H. Jones is president and L. I. Redmond is secretary. Special attention is now being paid to the manufacture of tools and appliances for motor car builders, and additions to the plant are under way.

Three More at Pontiac—Three big companies allied with the motor manufacturing industry have been secured for Pontiac, Mich. They are the Michigan Stamping Co., capital \$150,000; the Vulcan Gear Works, capital \$100,000, and the Pontiac Foundry Co. The Michigan Stamping Co. has not yet been organized. It will manufacture all kinds of sheet metal work used in motor car construction, including tenders, hoods, mud guards, shields, drip pans, etc. The Vulcan is now located at Detroit. When the factory in Pontiac is completed the machinery will be removed there. It is proposed to build homes for the employees. The company manufac-

The Motoring Bookman

"Magneto for Automobilists" is a red cloth-covered volume by S. R. Bottone and published by D. Van Nostrand Co., New York, and in London by Crosby, Lockwood & Son. This book, which is in its second edition, goes briefly in chapter I into the history, construction and function of the magneto; chapter II discusses the component parts of the magneto; chapter III deals with the subject of magnetizing the magnets; chapter IV treats of the armature screen and its function; chapter V, the high-tension magneto, followed by a few practical hints in chapter VI. In this, its second edition, has been added chapter VII, which describes in brief the most modern types of magnetos.

"Ignition, Timing and Valve Setting" is an illustrated manual for motor car owners, repairmen and operators, by Thomas H. Russell, and published by Charles C. Thompson Co., Chicago. The aim of the book is to enlighten the motorist on the subject of ignition to enable him to handle his car with skill and intelligence. Such subjects as electrical ignition for motor car engines, the magneto system, magneto ignition, ignition faults and hints, induction coils, timing ignition, valves and their functions, valve setting, etc., are discussed at length by the author. The book is bound in a red, limp-leather cover and contains 223 pages. Another book by the same author is entitled "Automobile Driving Self-Taught," which is a 222-page treatise on the operation, care and management of motor cars. The book aims to teach the motorist how to start, drive and manage his car; how to know the symptoms, causes and remedies for difficulties encountered in starting; the care of a car on a tour, etc.



MECHANICAL BRANCH OF THE FORD MOTOR CO. RECENTLY CONSTRUCTED IN BOSTON

tures gears, transmissions and other parts. The Pontiac Foundry Co. will manufacture all kinds of castings.

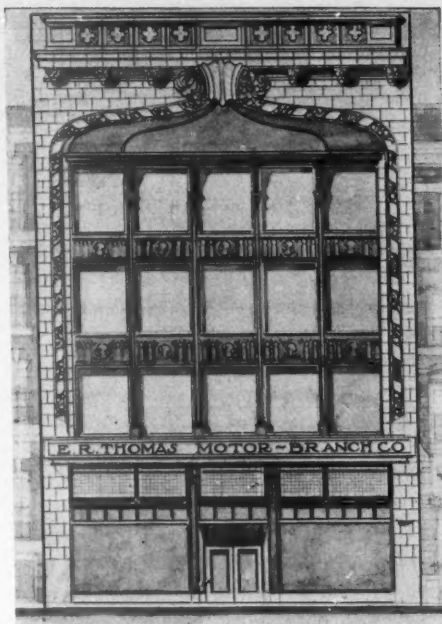
Stutz Makes a Change—Harry C. Stutz, who until recently was factory manager and engineer of the Marion Motor Car Co., of Indianapolis, has resigned to accept the position of president and manager of the Stutz Auto Parts Co. His new concern is now located in the Industrial building at Indianapolis. His time will now be devoted to manufacturing the Stutz gear systems and transmissions.

New Marquette Plant—Foundations for the Washington avenue buildings of the Marquette Motor Co. at Saginaw, Mich., are being rushed, and the structures probably will be completed within 3 months. All the mechanics who can be obtained are working on the erection of the factory. Manager Willett, of the plant, estimates the minimum number of employees for the plant at 1,000 as soon as the buildings are finished.

Goodyear Will Increase Stock—Notices have been sent out for a meeting of the stockholders of the Goodyear Tire and Rubber Co., of Akron, to be held at that place August 8, at which time the proposition to increase the capital stock of the corporation from \$1,000,000 to \$4,000,000 will be voted on. The notices were signed by George M. Stadelman, secretary of the company.

Apperson Makes Coast Deal—A large contract has been closed between the Apperson Brothers Automobile Co., of Kokomo, Ind., and Leon T. Shettler, of Los Angeles, Cal. Shettler has purchased 1,500 Apperson cars for 1911 and has been made the exclusive Apperson distributor for the Pacific coast territory. The new plan goes into effect immediately. Shettler will operate distributing depots in Los Angeles and San Francisco, Cal., and in Portland, Ore. The third large three-story building which the Appersons have erected within a year, will be ready for occupancy within 2 weeks, and plans are now under way for further enlarging the plant at Kokomo, which already has been greatly enlarged by the Appersons in recent years.

Hudson's New Plant Growing—With 300 men at work, forms arising, a mile of sewers laid, quantities of material piling up daily and the railroad laying its five sidings, the Hudson's new \$500,000 factory in Detroit begins to assume reality. At the present time the group of factory buildings, of which there are eight in number, are practically one-third finished. The contractors are working to complete the buildings by September 15. As an indication of the size of the new factory, the contractors have estimated the following amounts of material will be needed: 1,000,000 bricks, 500,000 feet of lumber, 400 tons of reinforced steel, 5,000 square feet of glass and 100,000 sacks of cement. If placed end to end, the bricks would more than stretch across the state of Michigan at its widest



NEW THOMAS BRANCH IN BOSTON

point; the lumber would reach over 94 miles, the sacks of cement would extend 9 miles.

Big Lamp Shipments—Gray & Davis, of Amesbury, Mass., are shipping the Cadillac Motor Car Co., of Detroit, Mich., four carloads of lamps per month, which is regarded as quite a feat.

Making Motor Trucks—The Whitewater Mfg. Co., of Whitewater, Wis., on July 1 began the regular production of motor trucks and delivery wagons, and now has its plant running to the limit.

Adding to Buick Plant—Work is being rushed on the additions which are being built to Buick factories Nos. 3 and 12 at Flint, Mich. When the addition to No. 12 factory is completed that building will be one of the largest belonging to the company. At factory No. 3 a new boiler room is being added. The drop forge, which is located north of Weston-Mott factory No. 5, is rapidly nearing completion. Machinery is being installed, and it is expected that the factory will be in readiness when the work on the 1911 models is taken up. Excavations also have been completed for the brass foundry, which will be built just east of factory No. 12.

Building at Lansing—The Atlas Drop Forge Co., of Lansing, Mich., is to have a large new building, work upon which is expected to be started in a week. The building will be located on Cedar street southeast of the present plant, and will be 200 by 60 feet, two stories in height, and will be built of brick. It will contain offices and the machine and die department. The drop forge company has been unable to fill its orders during the last year, but with the addition to the plant, as well as new boilers, it is expected that the work can be carried on more satisfactorily. With the completion of the new building it will be necessary to increase the working force

by thirty men. The output of the plant will be increased one-third. The improvements are expected to cost in the neighborhood of \$45,000.

Death of Edwin Rudd—Edwin Rudd, superintendent of the engine department of the Thomas B. Jeffery Co., Kenosha, Wis., died in Chicago after a long illness, aged 54 years. He has been employed by the Jeffery company since it was established, more than 17 years ago.

Tire Prosperity—At a meeting of the stockholders of the recently incorporated Superior Rubber and Mfg. Co., of Akron, O., steps were taken to increase the capital from \$10,000 to \$250,000. The capital stock is to be \$100,000 preferred and the remainder common stock. Temporary offices have been opened in the Doyle block, and plans for the construction of a large plant are now about ready. It is proposed to manufacture tires, in addition to other rubber articles. The officers of the company are: T. E. Moore, president; G. A. Shaw, vice-president; A. L. Wright, treasurer, and F. B. Adams, secretary.

Motor Car Literature

The Electric Storage Battery Co., Philadelphia, is mailing to the trade a booklet entitled "Undeveloped Central Station Business," in which is shown the benefits the electric lighting companies will derive from the more extended use of the electric vehicles.

The 1910 catalog of the Kearns Motor Car Co., Beavertown, Pa., describes and pictures in a conventional manner the Kearns model.

Bulletin No. 389 features the emergency and variable release valves of the National Brake and Electric Co., Milwaukee.

The Great Southern Automobile Co., in an advance sheet, is calling attention to its 1910 Great Southern model 50.

A most valuable reference book has been issued by the Royal Automobile Club, London, which is a table of motor cars manufactured during the years 1906-1910 inclusive. This table gives the bore of the cylinders and the Royal Automobile Club's rating.

"National 40" is the title of an attractive catalog from the National Motor Vehicle Co., Indianapolis, Ind., descriptive of the 1910 National model which is made in five-passenger touring, toy tonneau, speedway roadster, limousine, and torpedo types. The usual specifications and description are given. A page of line drawings shows a sectional view of the chassis and the oiling system employed on this model. The cover is a most attractive creation in its soft shade of ecru, in the center of which is an embossed reproduction of the nation's capitol, across the face of which appears in black raised letters the word "National." Just beneath this in black and gilt is the front of a radiator in the center of which are the figures "40."

PHILADELPHIA, Pa.—Frank Starbuck is now the Philadelphia agent for the De Tamble.

Portland, Ore.—The Brush Auto Co. has opened a Portland agency at 608-10 Washington street. William Wilzinski will be in charge.

Schenectady, N. Y.—Raymond Duntz has been granted a permit for a garage at the corner of Robinson and State streets, to cost \$4,000.

Shreveport, La.—T. M. Day and A. H. Kreiller are opening a garage as the D & K Auto Co., having located at the corner of Lilain and Spring streets.

Tacoma, Wash.—The Palmer-Singer Distributing Co., handling the Palmer-Singer cars, has opened its new garage at Ninth and Tacoma avenue, Tacoma.

Trenton, N. J.—The C. P. Weeden Motor Co.'s garage is opened at 153-55 Brunswick avenue, with accommodations for fifteen cars. The company is agent in Trenton for the Studebaker line.

Pittsburg, Pa.—The Pittsburg agency for the Chase Motor Truck Co. has been removed to 5987 Centre avenue, to give it more room. J. A. Upham and D. S. Craven are managers of the agency.

Philadelphia, Pa.—Clarence E. Purdy, formerly connected with the Bergdoll Motor Car Co., has been appointed superintendent of the Chalmers-Hipple Motor Car Co., 206 North Broad street.

East Palestine, O.—The McGraw Tire and Rubber Co. has broken ground for a large addition to its present plant here. It will add many new tire-building machines, so that the output will be doubled, and it will employ 200 men. The company has been running to capacity for the past 6 months.

Pittsburg, Pa.—The Remington Standard Motor Co. of Charleston-Kanawha, W. Va., has been organized with a capital of \$1,000,000 by George A. Grounds and DeWitt Bruce of Pittsfield, Mass., Philo E. Remington of Ilion, N. Y., and F. M. Staunton and Harrison B. Smith of Charleston, W. Va. The company proposes to establish one of the biggest plants in the United States and to employ 1,000 men. It will manufacture motor cars and

Brief Business

motor apparatus and aeroplanes and will be located around the old works of the Baldwin Steel Co. in Charleston.

Pittsburg, Pa.—The National Automobile Co. has leased the former quarters of the Standard Automobile Co. in Baum street, east end.

Seattle, Wash.—The Seattle branch of the Studebaker company has recently completed some necessary improvements, and now has 20,000 feet of floor space.

Pittsburg, Pa.—The Pittsburg Automobile Co. has secured the agency for Oakland for Pittsburg and towns within a radius of 200 miles. The sales will be managed by Julian Howe.

Greenwich, Conn.—Bell Brothers, of Stamford, Conn., have opened an accessories shop on Greenwich avenue with a full line of supplies and apparel. Frank N. Pennoyer has been put in charge.

Louisville, Ky.—The Hite-Bowman Co. is erecting a modern garage on Fourth avenue, near Oak street, to cost \$9,000. The building will be 67 by 80, brick, fireproof, and the roof will be supported altogether by trusses.

Boston, Mass.—The Rawles-Cobb Co., dealer in naval and mechanical supplies, has opened salesrooms for the Johnson cars, made in Milwaukee, at 741 Boylston street. The firm will sell both the pleasure and commercial vehicles.

Boston, Mass.—The repair department completed for the Ford branch in Boston has been turned over to the company. It is a three-story concrete building giving 17,000 square feet of space. The parts are on the first floor, repair department on the second and storage facilities for about sixty-five cars on the third. It is located

in Cambridge just over Harvard bridge. Manager Charles E. Fay has placed H. E. Partridge in charge of it.

Detroit, Mich.—The Detroit Seamless Steel Tubes Co. announces the appointment of H. S. White as sales manager.

South Bend, Ind.—The Moon Motor Car Co., of Indianapolis, has begun the erection of a garage and salesroom on Capital avenue.

Columbia, S. C.—A commission has been issued to the Roddey Automobile Co. to deal in motor cars and do a general repair and garage business.

Jefferson, Wis.—The Jefferson Auto Supply Co., recently organized by William Wagner and Frank Lamach, of Two Rivers, Wis., is now located in its big garage and repair shop in Jefferson.

Columbia, S. C.—The Gibbes Machinery Co. has opened a garage and branch store on Wentworth street, with E. N. McNulty in charge. The company will carry full machinery supplies, together with a stock of cars.

Omaha, Neb.—George F. Reim has secured the Cadillac agency and formed a partnership with W. R. Drummond to handle that car. The new firm will occupy the garage of C. F. Louck at 2550 Farnam street. Mr. Louck has gone into bankruptcy. He handled the Haynes, Halladay and Marmon cars.

Boston, Mass.—R. M. Daniels, manager of the Boston branch of the Studebaker company, has resigned and the Studebaker interests will be looked after in future by the E-M-F officials, Charles A. Malley and B. N. Crockett. The E-M-F salesrooms will be enlarged and both lines will be handled from the one place while the

Recent Incorporations

Lancaster, N. Y.—Lancaster Motor Co.; capital \$2,000; manufacture engines, motors, motor cars and accessories. Incorporators George A. Davis, Frederick Howard, Lancaster, N. Y.; Odell R. Blair, Buffalo, N. Y.

Wilmington, Del.—Pennsylvania Motor Car Co.; capital \$200,000. Incorporators C. L. Hearn, V. Atkinson, J. M. Frere.

Wilmington, Del.—Moore Electrical and Automobile Co.; capital \$50,000. Incorporators Enoch Moore, Jr., Rose E. Moore, Edward R. Pusey, all of Wilmington, Del.

Chicago.—Inland Motor Parts Co.; capital \$2,500; manufacture motor parts. Incorporators Fred C. Lindgren, Howard W. Corbett, Cortland A. Garner, Charles P. Root, all of Chicago.



FORD COMPANY'S BRANCH ON PEACHTREE STREET, ATLANTA, GA.

Announcements

E-M-F will not have to build a garage as planned, but will use the new Studebaker one.

Cleveland, O.—H. C. Twelvtree has taken the active management of the Cleveland Rambler agency.

Phoenix, Ariz.—Martin Mohrdieck has just started up in business at Five Points with the Arizona State Auto Works, and is the agent for the DeTamble. He formerly conducted the Standard Auto Works.

Pittsburg, Pa.—H. G. and R. G. Olivier have opened a supply store at Baum and Whitfield streets, east end. The new firm will be a branch of the Automobile Acetylene Co., whose charging plant is on Grant boulevard.

Laramie, Wyo.—The Lovejoy Novelty Works has enlarged its garage by the addition of a second story, which gives it a building two stories high and 48 by 132 feet. Elmer Loveday, president of the Laramie Automobile Club, is president of the company.

Philadelphia, Pa.—Announcement is made that the B. C. K. Motor Car Co., of Philadelphia, local representative of the Klinekar, had been purchased by W. D. Shepherd and T. W. Pritchard, comprising the Krit Sales Co., 203-205 North Broad street, and that from July 1 the Krit Sales Co. will be the distributing agency for both the Klinekar and the Krit.

Milwaukee, Wis.—The Buick Motor Co. has temporarily leased the west half of the first floor of the big Goldsmith building, Wisconsin and Jefferson streets, Milwaukee, Wis., which will be occupied as show rooms until the new Milwaukee branch building nearby is completed. The branch manager, George P. Hewitt, has had headquarters in the Matthews building, Grand

avenue and Third street, with a supply depot and repair shop on Thirteenth street, near Grand avenue.

Mt. Carmel, Ill.—B. H. Kamp has taken possession of his new garage in this town, carrying the Ford line.

Union City, Pa.—Jones & Gardner, of Union City, Pa., are building a garage 38 by 75 feet, and will start a repair shop there at once.

Cleveland, O.—George H. Votteler, formerly with the Sterling Motor Sales Co., Cleveland, is now with the Cleveland branch of the Stein Double Cushion Tire Co.

New York—William Schuette and Robert W. Schuette of Douglas Manor, L. I., appear as directors of the Gotham Motor Car Co., just organized with a capital of \$25,000.

Seattle, Wash.—After 3 years in business A. P. Nute, senior member of the firm of Nute & Keena, Seattle agents for the Packard, has sold his interest to J. T. Keena. The firm is now known as J. T. Keena & Co.

Cleveland, O.—H. G. English has been appointed manager of the Cleveland retail branch of the Broe Electric Co. Temporary salesrooms have been established at 6508 Euclid avenue. Permanent salesrooms will be located in the fall on Euclid avenue, in the building being built for the Broe company, near East Sixty-fifth street.

Cleveland, O.—A new company has been found to handle the Chalmers and Hudson cars in Cleveland and vicinity. E. B. Finch, for the last 2 years connected with the Chalmers factory, will be the manager and principal stockholder of the firm which bears his name. Finch's agency will be temporarily located at 6506 Euclid avenue,

but plans are under way for a new building. The territory will include Cleveland and northern Ohio.

Spokane, Wash.—The B. F. Goodrich Co. has opened a branch in Spokane at 5151 Post street, under the management of W. J. Rooper.

New York—The Bush Terminal Co. has bought 331-339 East Twenty-ninth street. The site is 101.3 by 98.9, with a rear line of 115.5. A ten-story building will be erected and will be used in connection with its motor delivery system throughout the three boroughs.

Pittsburg, Pa.—The Standard Automobile Co. is now located in its new building at Grant boulevard and Bellefield avenue. The Speedwell Automobile Co. has remodeled its garage at 5922-5924 Baum street and now has much larger and better equipped quarters.

New York—The Dunlop-Taylor Motor Co., of 1876 Broadway, New York city, is the latest arrival on Broadway. The firm will handle and distribute the Westcott in New York and New England. C. M. Dunlop is president and B. C. Taylor is vice-president and general manager.

Washington, D. C.—J. J. Bartram has purchased the garage business of the Cook & Stoddard Co., Twenty-second and P streets, northwest. The building has been sold and will be turned into a riding academy. He has also bought the Atlas garage, 1206 New Hampshire avenue, northwest.

North Bergen, N. J.—The Hudson County Automobile Co., of North Bergen, is moving into new and commodious quarters on the boulevard loop and Twenty-seventh street, in North Bergen. In addition to a general garage and supply business, it will carry the Westcott for Bergen county. F. C. Green is manager.

Boston, Mass.—The Fisk Rubber Co., of Chicopee, has closed a deal with a prominent Boston real estate man to erect a new building for it on Boylston street in the heart of the motor colony. Work will be started on it at once. This will make four new buildings upon which work will be going simultaneously for motor concerns, the others being the Thomas, Fiat and Hartford Rubber Co.



STORE OF MAXWELL-BRISCOE COLUMBUS CO. AT COLUMBUS, OHIO

Now in Agencies

Columbus, O.—Early Motor Car Co., Chase truck.

Seattle, Wash.—Marine-Delay Co., Cole.

Spokane, Wash.—Leach & Carr, Maytag.

Omaha, Neb.—Kissel Auto Co., Warren-Detroit.

Omaha, Neb.—Sweet-Edwards Automobile Co., R. A. C.

Hastings, Neb.—Nebraska Motor Car Co., Parry and Warren-Detroit.

Des Moines, Ia.—W. K. Adolph, Clark.

Salt Lake City, Utah.—Henry Kaar, Locomobile.

New Orleans, La.—Davis Motor Vehicle Co., Selden.

Elmira, N. Y.—Theo. Friendly Co., Selden.

Houston, Tex.—South Texas Auto Co., Selden.



Legal Lights and Side Lights

SAY LAW IS TOO DRASTIC

HERE is a division of sentiment among Cleveland motorists over the passage of a city ordinance requiring motor car drivers following street cars to bring their machines to a stop when a street car comes to a standstill to take on or let off passengers. A number of motorists, including the president of the Cleveland Automobile Club, favor the ordinance. The club president makes the interesting statement that a car loaded with passengers has greater traffic rights than a motor car, and that any ordinance which permits a passenger to reach his home without injuring his feelings or his body by motorists is for the best good of motorists in general. Others say that the measure is too drastic, that it will seriously delay traffic and that eventually it will drive motorists off all streets with car lines. An attempt will be made to have this ordinance repealed and to substitute one requiring drivers to leave a 4-foot leeway between street cars and their machines. Failing in this motorists will seek to have a street leading from the public square out into the east end given over to motor traffic alone.

NEW CINCINNATI LAW

The ordinance introduced at the last meeting of the city council of Cincinnati, O., by Councilman Samuel Moyer to suppress motor noises in Cincinnati was passed and is now on the city ordinance books. The ordinance requires mufflers to deaden the sound of the exhaust, and this applies generally instead of only at certain hours. The only kind of a warning signal on cars must be a reed horn of low tone, except electric machines, which may have a bell not more than 5 inches in diameter. This does not include machines of the police and fire departments, the salvage corps or the traction company. There must be no work in garages making an unusual noise between 8 p. m. and 7 a. m., and none at all on Sunday. Violations are punishable by a fine of from \$10 to \$50.

RIGHTS ON THE HIGHWAYS

All persons using a public highway have equal rights, and one using a motor car must have due regard for the equal rights of others, taking into consideration the tendency of his machine to frighten horses and cause injury to travelers. In an action for injuries caused by the plaintiff's horse becoming frightened at the defendant's motor car, as exemplified in the case of the Haynes Automobile Co. vs. Sinnett, 91 N. E., Indiana, 171, an instruction that the driver of a motor car must use due care in regulating his speed so as not to endanger the life and limb of others lawfully

using the highway, and that the speed of a car must be reasonable, is not objectionable as based upon the theory that the driver was guilty of the crime of operating the car at a rate of speed greater than was reasonable and proper.

The law requires that motor cars shall not be run at an unreasonable rate of speed, and, if this law is disregarded and injury follows to a traveler lawfully occupying the highway, the owner is liable for damages, and, in an action for injuries caused by the plaintiff's horse becoming frightened at the defendant's car, the court in this case referred to refused to instruct that, if the defendant was not operating his car at a speed of more than 20

miles an hour, the plaintiff could not recover damages from the defendant.

Two very important questions to the motorists recently were clearly settled by the supreme court of Wisconsin. The first question was whether a car is such a dangerous machine as to place it in the category with the locomotive, ferocious animals, dynamite, and other dangerous contrivances. The court held that it was not, and that the owner was liable for a failure to use ordinary and reasonable care, but that the owner was not held to the standard of exercising the utmost care. The other question, in *Steffen vs. McNaughton*, 124 N. W., 1016, had to do with the liability of the owner of a motor car for an injury caused by the chauffeur while driving the car at a time and upon an occasion not within his employment as a chauffeur. The court held on this question that, "The contract of employment as chauffeur did not embrace the use of the motor car by the chauffeur for going to his meals, but as it provided that he should furnish his own meals, it carried with it the further condition that he was to have the required time at noonday, and might leave the service for the required period, and while he was so engaged, his employment and the relation of master and servant were suspended, and he had no permissive right to use the motor car to facilitate his labor and service; and where he did so, and injured a person on the street, he was acting outside the scope of his employment and the owner was not liable."

RICHMOND LEGISLATION

The city council of Richmond, Va., now is preparing to pass an ordinance regulating the kind of horn to be used on all motor cars within the city limits. Objections have been received regarding the siren variety, and the proposed ordinance will prescribe a milder, though effective horn. At a recent meeting of the Richmond Automobile Club, unqualified endorsement was given by that organization to an ordinance now pending before the city council, which will prohibit persons under 18 years of age from driving cars in the city. The club entered earnest protest, however, against the proposed levying of a tax of \$1 on all persons driving a car. The club members have long been desirous of having historical old Hollywood cemetery, where lay many distinguished Virginia heroes, open for a short time each day to motorists. Action was taken in this matter, and the lot owners of the cemetery will be asked for the privilege. If a majority favors the proposition, the cemetery company will be petitioned to that effect by the club members.



CLAIMS RECORD SHIPMENT

Kansas City, Mo.—Editor Motor Age—The writer notices by a recent issue of Motor Age that the Overland company shipped a trainload of machines to Minneapolis, Minn. I take this method of advising that I recently received here at Kansas City a solid trainload of 204 model 38 Overlands—thirty-four carloads with six machines to the car, or if they had been shipped three to the carload as is generally done we would have had a trainload of sixty-eight carloads. I believe that this is one of the largest, if not the very largest, shipments of motor cars that has ever moved in the United States. These cars will be distributed out of Kansas City during this month on account of the enormous wheat harvest that we have out here in the short grass country of western Kansas. I might also add that in addition to this we have received one consignment of seventy-two machines, another consignment of forty-eight, or a total of 324 machines within 10 days.—H. G. Kirkland.

STORAGE BATTERY CUT-OUT

Amesbury, Mass.—Editor Motor Age—In answer to a recent Clearing House article regarding cut-out for storage battery, we would state we have two cut-outs. One cuts off the battery from the dynamo when the dynamo is below a charging state, while the other cut-out cuts out the battery automatically from the dynamo when the battery voltage rises. This latter cut-out can be set to cut the battery out at 6½, 7 or 7½ volts, whichever is desired. We only sell this in connection with the unit dynamo system.—Gray & Davis.